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Trimestriel de la Société Belge de Malacologie
association sans but lucratif
Quarterly of the Belgian Malacological Society

VOL. 15 (1) 2014 10 MARS

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ISSN 1375-7474

Périodique trimestriel
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SOCIETE BELGE DE MALACOLOGIE

Cerithiopsidae and Newtoniellidae (Gastropoda: Triphoroidea Gray) from French Polynesia area (South Pacific Ocean)

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KEYWORDS. Mollusca, Gastropoda, Caenogastropoda, Triphoroidea, French Polynesia.

ABSTRACT. Fifty-seven species of Cerithiopsidae and Newtoniellidae from French Polynesia are recorded and listed, extending their range distribution. A new genus, *Australopsis*, fifteen new species of Cerithiopsidae and two new species of Newtoniellidae are described.

RESUME. Cinquante-sept espèces de Cerithiopsidae et Newtoniellidae de Polynésie française sont répertoriées et listées, étendant leurs aires de distribution géographique. Un nouveau genre, *Australopsis*, quinze nouvelles espèces de Cerithiopsidae et deux nouvelles espèces de Newtoniellidae sont décrits.

INTRODUCTION

We recently published two books on the Family Cerithiopsidae from the coast of the Central Philippines and Vanuatu identifying 261 new species and establishing 2 new genera (Cecalupo & Perugia, 2012; 2013). The purpose of this paper is to continue the identification of these micro-molluscs from some areas in French Polynesia.

Tröndlé & Boutet (2009) published a list of species from Polynesia reporting only 3 species of Cerithiopsidae and no Newtoniellidae, but they mention 25 additional, unidentified species. This paper allows us to add 74 new records to the list, of which 17 new species and a new genus of Cerithiopsidae.

Number of new species classified by genera

Cerithiopsidae: *Australopsis* n. gen: 1; *Clathropsis*: 3; *Joculator*: 2; *Marshallopsis*: 4; *Prolixodens*: 1; *Seila*: 2; *Synthopsis*: 2.
Newtoniellidae: *Cerithiella*: 1; *Eunetula*: 1.

MATERIALS AND METHODS

The material examined was collected during the expeditions conducted by MNHN in the Tropical Indo-Pacific. Specimens were collected during following cruises: **Austral Is.**, N/O "Alis" campagne BENTHAUS 2002, 2011; **Austral Is., Rapa**, Atelier RAPA (2002); **French Polynesia Is.** (1990, 1991); **Marquesas Is.** N/O "Alis" campagne TARASOC (1997); **Society Is.** N/O "Alis" campagne TARASOC (2009); **Tarava Seamounts Is., Mont Punu Taipu,** N/O "Alis", campagne TARASOC (2009); **Tuamotu Is.**, N/O "Alis" campagne TARASOC (2009).
We also examined material from the private collections of Jean Letourneux and Michel Boutet (Tahiti) and of Jean Tröndlé (France).
Coll. Michel BOUTET.
Localities: Society Is., Tuamotu Is., number of specimens examined: 37.
Coll. Jean LETOURNEUX.
Localities: Society Is., Tuamotu Is., Marquesas Is., Austral Is., approximately number of specimens examined: 500.
Coll. Jean TRÖNDLÉ.
Localities: Society Is., Tuamotu Is, Marquesas Is., number of specimens examined: 752.

In the generic classification we gave priority to the type of protoconch. The species occasionally has some different morphological characters than these encountered in the genus in which it is placed. In this case we discuss about this doubtful classification. Only the study of the soft parts and the discovery of additional specimens will clarify these doubts. In this paper we consider appropriate to introduce the new genus *Australopsis*. Given the known difficulties in the discovery of shells belonging to this family, often without protoconch, and considering that the main purpose of our work is to identify as many species as possible for a geographic area which is not really easily accessible, we decided to introduce new species also based on a single specimen, however, with an intact protoconch and therefore correctly identifiable.

CLASSIFICATION

Our classification is only based on the shell characters, the soft parts are unknown. We mainly follow the provisional classification of the family proposed by Marshall (1978), using the same distinctive characters.

The size: we use the following terms: very large ≥14 mm, large 6÷14 mm, medium 3÷6 mm, small 2÷3 mm, very small >2 mm. Variation in size is common, particularly in *Joculator* and *Horologica*.

The protoconch: this is the most important character to identify a species. The protoconch is very fragile, often missing in the available samples, and the lack of its detailed description can make difficult or impossible to identify correctly the species.

The teleoconch: the number of the spiral cords, of the axial ribs and the depth of the suture is important. The shape of the shell, the number of whorls, the maximum width and the prominence of beads at the intersections of the spiral cords and the axial ribs are also useful. In *Horologica* species there is occasionally a third spiral cord resulting from the division of the adapical cord.

The colour: it is quite constant and is an excellent character for a preliminary identification of the species; also to consider the range of variability especially for dead collected specimens.

The body whorl: we want to highlight the last whorl, particularly the limit between the base and the columella, a feature that seems to be constant in the specimens belonging to a same genus.

The current classification, updated by Bouchet & Rocroi (2005), differs slightly from that proposed by Marshall (1978).

The superfamily Triphoroidea Gray, 1847 is actually divided into three families: Triphoridae Gray, 1847, Cerithiopsidae H. Adams & A. Adams, 1853 and Newtoniellidae Korobkov, 1955.

The Cerithiopsidae are now divided into 3 subfamilies: Aliptinae Marshall, 1978, Cerithiopsinae H. Adams & A. Adams, 1853 and Seilinae Golikov & Starobogatov, 1975.

The subfamily Eumetulinae Golikov & Starobogatov, 1975 is now moved to the family Newtoniellidae.

Abbreviations and text conventions

Repositories

MNHN: Muséum national d'Histoire naturelle, Paris, France.
MSNM: Museo Civico di Storia Naturale, Milano, Italy.
UMB: Università Milano Bicocca, Dipartimento Scienze Geologiche e Geotecniche, Milano, Italy.
But: collection Boutet Michel, Papara, Tahiti, Polynésie française.
Ltn: collection Letouneux Jean, Mahina, Tahiti, Polynésie française.
Trn: collection Tröndlé Jean [France], attaché au Muséum national d'Histoire naturelle, Paris.

Other abbreviations

ICZN: International Code of Zoological Nomenclature.
juv: juvenile form
SEM: Scanning Electron Microscope.
spm(s): specimen(s)
stn: station

SYSTEMATICS

Family **CERITHIOPSIDAE** H. Adams & A. Adams, 1853
Genus ***Australopsis*** n. gen.
Type species: *Australopsis floresi* n. sp., Austral Is., Rapa.

Diagnosis: shell medium sized, conical, regularly increasing with flat sides and impressed suture, base moderately constricted. Protoconch of lecithotrophic type, of 2.5 whorls, blunt-tipped; whorls crossed by sub-median granulose carina, finer grains may extend over the entire surface of whorls.

Remarks. The decision to establish a new genus comes from the peculiar sculpture of the protoconch that has never been observed in the family Cerithiopsidae; more like the protoconchs of Triphoridae where, however, the genera with dextral shell always have a teleoconch with a sculpture of 4 or more spirals. The soft parts are unknown.

Australopsis floresi n. sp.
Figs 1-4, 24-30

Type material. Holotype - MNHN (n° Moll 26460), dim. 5.40 x 1.37 mm, protoconch 0.42 x 0.35 mm, RAPA 2002, stn 34.
Paratype 1 - MNHN (n° Moll 26461), dim. 4.60 x 1.35 mm, protoconch 0.42 x 0.32 mm, RAPA 2002, stn 27.
Paratype 2 - MNHN (n° Moll 26462), dim. 4.65 x 1.26 mm, protoconch 0.43 x 0.35 mm, RAPA 2002, stn 34.
Paratype 3 - MNHN (n° Moll 26462), dim. 4.65 x 1.27 mm, protoconch 0.42 x 0.37 mm, RAPA 2002, stn 34.

Type locality. Austral Is., Rapa, cave at SE Pointe Tematapu, 29 spms, 2-8 m, 27°34,8'S, 144°19,0'W, falling into large cave, muddy bottom, 19 nov. 2002.

Material examined. French Polynesia, Austral Is.: Rapa, stn 5, south of Tarakoi Is., 1 spm, 8 m, 27°5.6'S, 14.4°18.5'W, dead coral with algae, muddy-

sandy zones, 04 nov. 2002; stn 9, Baie Hiri, 16 spms, 3-24 m, 27°37.3'S, 144°22.2'W, coral, 06 nov. 2002; stn 10, Pointe Komire, 4 spms, 16-18 m, 27°34.8'S, 144°22.8'W, stones covered with brown algae, 07 nov. 2002; stn 11, N Rapa, Iti Is., 5 spms, 2 m, 27°37.2'S, 144°18.2'W, sandy area on rocky bottom and dead coral, 07 nov. 2002; stn 16, W Tauna Is., 6 spms, 5 m, 27°36.3'S, 144°18.4'W, mainly dead coral, 09 nov. 2002; stn 17, SW Rarapai Is., 8 spms, 10 m, 27°34.6'S, 144°22.7'W, heap of stones on sandy bottom, 10 nov. 2002; stn 20, Vavai, 4 spms, 5 m, 27°35.4'S, 144°23.3'W, blocks of coral on sandy bottom, 12 nov. 2002; stn 21, E Tapuaki Is., 7 spms, 5 m, 27°34.2'S, 144°20.6'W, blocks of dead coral on sandy bottom, 12 nov. 2002; stn 27, SW Pointe Gotenaonao, 2 spms, 6 m, 27°38.7'S, 144°19.2'W, heap of stones covered with brown algae, 14 nov. 2002 (1 paratype MNHN); stn 30, Pointe Mei, 2 spms, 16-20 m, 27°38.2'S, 144°18.2'W, dead coral on drop off, 16/18 nov. 2002; stn 32, Vavai, 2 spms, 15-20 m, 27°35.0/35.8'S, 144°22.7/23.0'W, coral, 18/23 nov. 2002; stn 34, cave at SE Pointe Tematapu, 29 spms, 2-8 m, 27°34,8'S, 144°19,0'W, falling into large cave, muddy bottom, 19 nov. 2002 (holotype MNHN, 2 paratypes MNHN); stn 44, NW Tauna Is., 27 spms, 30 m, 27°36.3'S, 144°18.2'W, drop off with muddy zones, 27 nov. 2002; stn 48, off Pointe Rokuaga, 1 spm, 36 m, 27°34.1'S, 144°22.1'W, plateau covered by sand, 30 nov. 2002.

Description of the holotype. Shell medium in size, conical with convex regularly increasing whorls, slender with flat sides, last whorl slightly constricted; light-salmon but shell clearly discoloured, base darker. Protoconch of lecithotrophic larval type, blunt-tipped of 2.5 whorls sculptured with one prominent, rounded, sub-median spiral carinae crossed by irregular grains. Teleoconch of 10.5 whorls, perfectly conical, sculpture reticulate of 3 equidistant spiral cords, equal in width, crossed by wider, prosocline axial ribs (about 20 on last whorl). Suture impressed. In last whorl emerging, from insertion of outer lip, fourth spiral cord. Columella short, separated from flat base of last whorl by furrow; aperture sub-quadrate, outer lip thin and indented by sculpture; siphonal canal open.

Remarks. These Cerithiopsidae from Austral Is. show an interesting protoconch; the many specimens observed show a darker colour with the third spiral cord red brown. Under SEM the surface of the protoconch appears to be minutely granulated throughout. Severns (2011: 236, pl. 101, Figs 5) illustrate an unidentified sample of the genus *Metaxia* from Hawaii (fam. Triphoridae) with convex whorls and sculpture of 4 spiral cords but with similar protoconch.

Etymology. Dedicated to Heimata Florès, guide and advisor during the worshop "Atelier Rapa".

Genus ***Clathropsis*** Laseron, 1956
Type species: *Clathropsis impedita* Laseron, 1956, by original designation, Masthead Is., Capricorn Group, Qld, Australia,

Clathropsis tuanainaii n. sp.
Figs 6, 33-34

Type material. Holotype - MNHN (n° Moll 26464), dim. 2.32 x 0.75 mm, protoconch 0.46 x 0.27 mm, RAPA 2002, stn 36.

Type locality. Austral Is., Rapa, Pointe Kauria, 1 spm, 27 m, 27°33.5'S, 144°20.8'W, mainly living on coral, 21 nov. 2002.

Material examined. French Polynesia, Austral Is.: Rapa, stn 36, Pointe Kauria, 1 spm, 27 m, 27°33.5'S, 144°20.8'W, mainly living coral, 21 nov. 2002 (holotype MNHN).

Description of the holotype. Shell juvenile, conical with convex regularly increasing whorls, base excavate, suture impressed, colour yellowish. Protoconch short, cylindrical, of 2.5 convex whorls sculptured with minute irregular grains stronger in central zone, apex rounded. Colour whitish, semitransparent. Teleoconch of about 6 slightly convex whorls with reticulate sculpture of 3 equal spiral cords crossed by narrower axial ribs (16 on last whorl) forming beads at each intersection with spiral cords. Fourth cord emerging from suture on last whorl. Under SEM limit between columella and base is highlighted by furrow, columella short, crossed by growth lines throughout. Ridge bordering sub-quadrate aperture with outer lip indented by sculpture. Siphonal canal open.

Remarks. *Clathropsis tuanainaii* n. sp. is compared with *Tubercliopsis cataldinii* Cecalupo & Perugia, 2013 (Vanuatu Is.) which has an almost similar protoconch but which can be easily separated by the shape of the teleoconch.

Etymology. Dedicated to Tuanainai Narii, mayor of the village Ahurei which hosted the Rapa workshop team for 6 weeks.

Clathropsis peculiaris n. sp.
Figs 7, 35-36

Type material. Holotype - MNHN (n° Moll 26465), dim. 3.45 x 1.10 mm, protoconch 0.59 x 0.27 mm, TARASOC, stn DW3442.

Type locality. Society Is., between Raiatea & Tahaa, 515-550 m, 16°41'S, 151°26'W, 16 oct. 2009.

Material examined. French Polynesia, Society Is.: between Raiatea & Tahaa, N/O "Alis" campagne

TARASOC, stn DW3442, 1 spm, 515-550 m, 16°41'S, 151°26'W, 16 oct. 2009 (holotype MNHN)

Description of the holotype. Shell of medium size, conical with convex, regularly increasing whorls, turrited; base excavate. Protoconch acute, conical of 4.5 smooth convex whorls; last 2.5 with prominent, about sub-median, broad, rounded carina. Showing under SEM: two apical whorls granulate, next are smooth except for band of minute, irregular granulation on carina; suture marked by thin cord and abapical thin band of small, regularly spaced, grains. Colour yellowish, semitransparent. Teleoconch of 6.5 convex whorls with well impressed suture. Reticulate sculpture of 3 spiral cords (first immediately under suture, second thicker), crossed by axial ribs (16 on last whorl). Under SEM: limit between base and columella highlighted by weak groove. Squared tubercles at each intersection of spiral cords with axial ribs. Another narrow beaded spiral at base of last whorl. Columella short, acuminate; aperture with outer lip thin, indented by sculpture and wide siphonal canal. White.

Remarks. The protoconch of *Clathropsis peculiaris* has an interesting sculpture while in the diagnosis of the genus (Laseron, 1956) there are no references to sculpture (obviously Laseron could not rely on a SEM analysis). The teleoconch showing all the characteristics typical of the genus *Clathropsis* and, being soft parts unknown, we must consider that the genus present a range of variability of the sculpture in the protoconch.

Etymology. Latin, *peculiaris*, in English peculiar, for the sculpture of its protoconch.

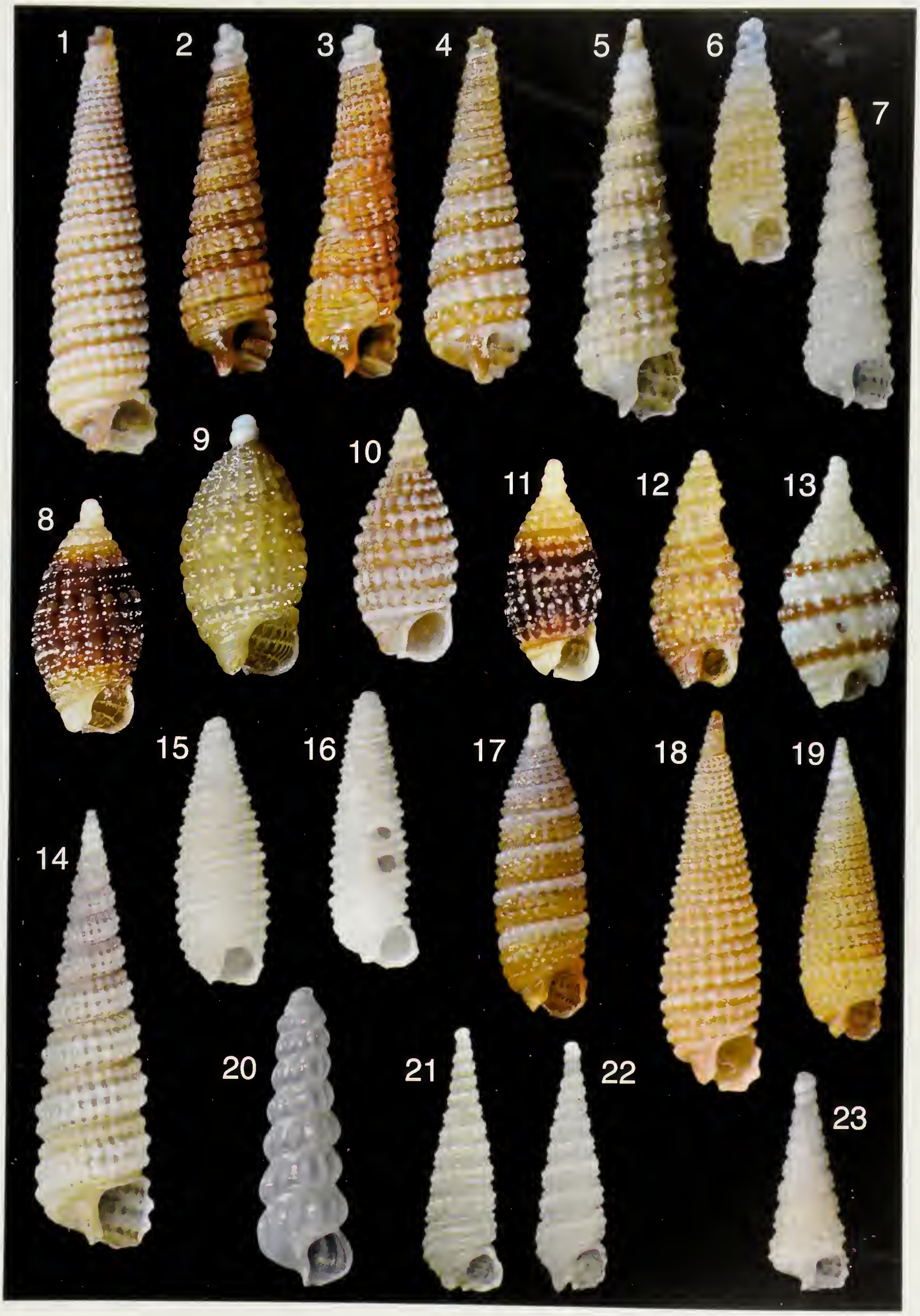
Clathropsis payriae n. sp.
Figs 5, 31-32

Type material. Holotype - MNHN (n° Moll 26466), dim. 4.40 x 1.25 mm, protoconch 0.37 x 0.22 mm, RAPA 2002, stn 32.
Paratype 1 - MNHN (n° Moll 26467), dim. 4.20 x 1.12 mm, protoconch 0.37 x 0.20 mm, RAPA 2002, stn 31.
Paratype 2 - MNHN (n° Moll 26468), dim. 4.45 x 1.14 mm, protoconch 0.37 x 0.21 mm, RAPA 2002, stn 32.
Paratype 3 - MNHN (n° Moll 26469), dim. 3.90 x 1.05 mm, protoconch 0.37 x 0.20 mm, RAPA 2002, stn 44.

Type locality. Austral Is., Rapa, Vavai, 15-20 m, coral, 27°35.0/35.8'S, 144°22.7/23.0'W, 18/23 nov. 2002.

Figures 1 - 23

1 - 4. *Australopsis floresi* n. sp., Austral Is., Rapa. **1.** Holotype MNHN (n° Moll. 26460), 2-8 m [RAPA 2002, stn 34, Cave at SE Tematapu point], 5.40 x 1.37 mm; **2**. Paratype 1, MNHN (n° Moll. 26461), 6 m [RAPA 2002, stn 27, SW Gotenaonao point], 4.60 x 1.35 mm; **3**. Paratype 2, MNHN (n° Moll. 26462), 2-8 m [RAPA 2002, stn 34, Cave at SE Tematapu point], 4.65 x 1.26 mm; **4**. Paratype 3, MNHN (n° Moll. 26462), 2-8 m [RAPA 2002, stn 34, Cave at SE Tematapu point], 4.65 x 1.27 mm; **5**. *Clathropsis payriae* n. sp., Austral Is., Rapa, holotype MNHN (n° Moll. 26466), 15-20 m [RAPA 2002, stn 32, Vavai], 4.40 x 1.25 mm; **6.** *Clathropsis manainaii* n. sp., Austral Is., Rapa, holotype MNHN (n° Moll. 26464), 15-20 m [RAPA 2002, stn 36, Kauria point], 2.32 x 0.75 mm; **7**. *Clathropsis peculiaris* n. sp., Society Is., holotype MNHN (n° Moll. 26465), 15-20 m [TARASOC, stn DW3442], 3.45 x 1.10 mm; **8**. *Joculator itiensis* n. sp., Austral Is., holotype MNHN (n° Moll 26472), 2 m [RAPA 2002, stn 11, N Rapa Iti Is.], 1.95 x 0.85 mm; **9**. *Joculator bouteti* n. sp., Austral Is., holotype MNHN (n° Moll. 26470), 2 m [RAPA 2002, stn 6, Rapa Is.], 1.67 x 0.77 mm; **10**. *Marshallopsis bazzocchii* n. sp., Marquesas Is., holotype MNHN (n° Moll. 26475), 2 m [MUSORSTOM 9, stn DR1247, Fatu Hiva Is.], 2.02 x 0.82 mm; **11**. *Marshallopsis trondlei* n. sp., Tahiti, holotype MNHN (n° Moll. 26479) [stn DR1247, Tahiti Is. Arue], 1.88 x 0.84 mm; **12**. *Marshallopsis letourneuxi* n. sp., Marquesas Is., holotype MNHN (n° Moll. 26476), 68 m [Ua Pou Haakuti], 1.47 x 0.56 mm; **13**. *Marshallopsis tahitiensis* n. sp., Tahiti Is., holotype MNHN (n° Moll. 26478), 30-60 m [Afaahiti], 1.85 x 0.90 mm; **14**. *Prolixodens proxima* n. sp., Marquesas Is., holotype MNHN (n° Moll. 26480), 340-352 m [MUSORSTOM 9, stn DW 1222, Hiva Oa Is.], 5.30 x 1.50 mm; **15**. *Seila societatis* n. sp., Society Is., holotype MNHN (n° Moll. 26484), 720 m, [TARASOC, stn DW3474, Moorea], 3.65 x 1.22 mm; **16**. *Seila retusa* n. sp., Tuamotu Is., holotype MNHN (n° Moll. 26483), 507-607 m [TARASOC, stn DW3373, Kaukura], 3.65 x 1.05 mm; **17**. *Synthopsis rapaensis* n. sp., Austral Is., Rapa, holotype MNHN (n° Moll. 26485), 2-8 m [RAPA 2002, stn 34, SE Tematapu], 3.60 x 1.05 mm ; **18 - 19**. *Synthopsis vavaiensis* n. sp., Austral Is. Rapa, **18.** Holotype MNHN (n° Moll. 26493), 15-20 m [RAPA 2002, stn 32, Vavai], 4.44 x 1.28 mm; **19**. Paratype 1, MNHN (n° Moll. 26494), 3 m, [RAPA 2002, stn 25, Anatakuri Nako bay], 3.68 x 1.05 mm; **20**. *Emmetula albachiarae* n. sp., Tuamotu Is., Rapa, holotype MNHN (n° Moll. 26491), 462-980 m, [TARASOC, stn DW3359, Kaukura], 4.70 x 1.32 mm; **21 - 23**. *Cerithiella francescoi* n. sp., Tuamotu, Anaa Is., **21.** Holotype MNHN (n° Moll. 26488), 3.45 x 0.90 mm; **22**. Paratype 2, MNHN (n° Moll. 26490), Tuamotu, Anaa Is., 3.00 x 0.85 mm; **23**. Paratype 1, MNHN (n° Moll. 26489), 507-607 m, [TARASOC, stn DW3373, Kaukura], 2.76 x 0.93 mm.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Material examined. French Polynesia, Austral Is.: Rapa, stn 4, Rarapai Is., 3 spms, 18 m, heap of stones covered by brown algae, 27°34.3'S, 144°22.1'W, 04 nov. 2002; stn 5, south of Tarakoi Is., 1 spm, 8 m, dead corals with algae, muddy sand zones, 27°5.6'S, 14.4°8.5'W, 04 nov. 2002; stn 6, off Baie Ahurei, 13 spms, 42 m, living and dead coral, 27°36.8'S, 144°16.7'W, 05 nov. 2002; stn 8, SE Tauna Is., 5 spms, 52-57 m, rocky bottom with sandy area, 27°36.5'S, 144°17.7'W, 06/22 nov. 2002; stn 9, Baie Hiri, 6 spms, 3-4 m, coral, 27°37.3'S, 144°22.2'W, 06 nov. 2002; stn 31, Pointe Mei, 2 spms, 6 m, heap of stones, 27°38.2'S, 144°18.2'W, 16 nov. 2002 (1 paratype MNHN); stn 32, Vavai, 15 spms, 15-20 m, coral, 27°35.0/35.8'S, 144°22.7/23.0'W, 18/23 nov. 2002 (holotype MNHN, 1 paratype MNHN); stn 44, au NW Tauna Is., 13 spms, 30 m, drop off with muddy zones, falling with muddy past, 27°36.3'S, 144°18.2'W, 27 nov. 2002 (1 paratype MNHN); stn 47, Baie Ahurei bay, 6 spms, 33 m, mud with coral heads, 27°36.7'S, 144°19.1'W, 29 nov 2002.

Description of the holotype. Shell medium in size, conical with convex regularly increasing whorls, suture strongly impressed, base excavate. Protoconch near cylindrical, of 3 convex whorls. Under SEM: apex spherical, initially smooth then showing rather regular granulation extended to entire second whorl and arranged in 5 lines. Colour yellowish, opaque. Teleoconch of 8.5 convex whorls. Reticulate sculpture of 3 spiral cords crossed by axial ribs (16 on last whorl); spirals and ribs equal in size. Beads at each intersection of spiral cords with axial ribs. Fourth spiral at base of last whorl. Under SEM: thin close-set axial threads on entire surface; limit between flat base of spire and columella highlighted by weak groove. Shell covered by thin, transparent periostracum. Columella acuminate, crossed by many growth lines; aperture sub-circular with siphonal canal well defined. Outer lip thin, indented by sculpture. Background colour yellowish, semitransparent.

Remarks. *Clathropsis payriae* n. sp. is compared with *C. poppearum* and *C. zannii*, both of Cecalupo & Perugia, 2012 from Central Philippines; the first has the main difference in the protoconch of 4.5 whorls vs 3, *C. zannii* has a protoconch of 3.5 whorls and an apex with a different, thicker, granulation. It is also compared with *C. tuanainaii* n. sp. (see below), which has a similar protoconch but shorter, of 2.5 whorls with more marked granulation, and a larger but narrower teleoconch.

Etymology. Named after Claude Payri, Université de Polynésie française, (coordinator of " Faune et Flore de Rapa") who very efficiently coordinated this field work in Rapa.

Genus ***Joculator*** Hedley, 1909
Type species: *Cerithiopsis ridicula* Watson, 1886. Wednesday Is., Cape York, NE Australia.

Joculator bouteti n. sp.
Figs 9, 37-38

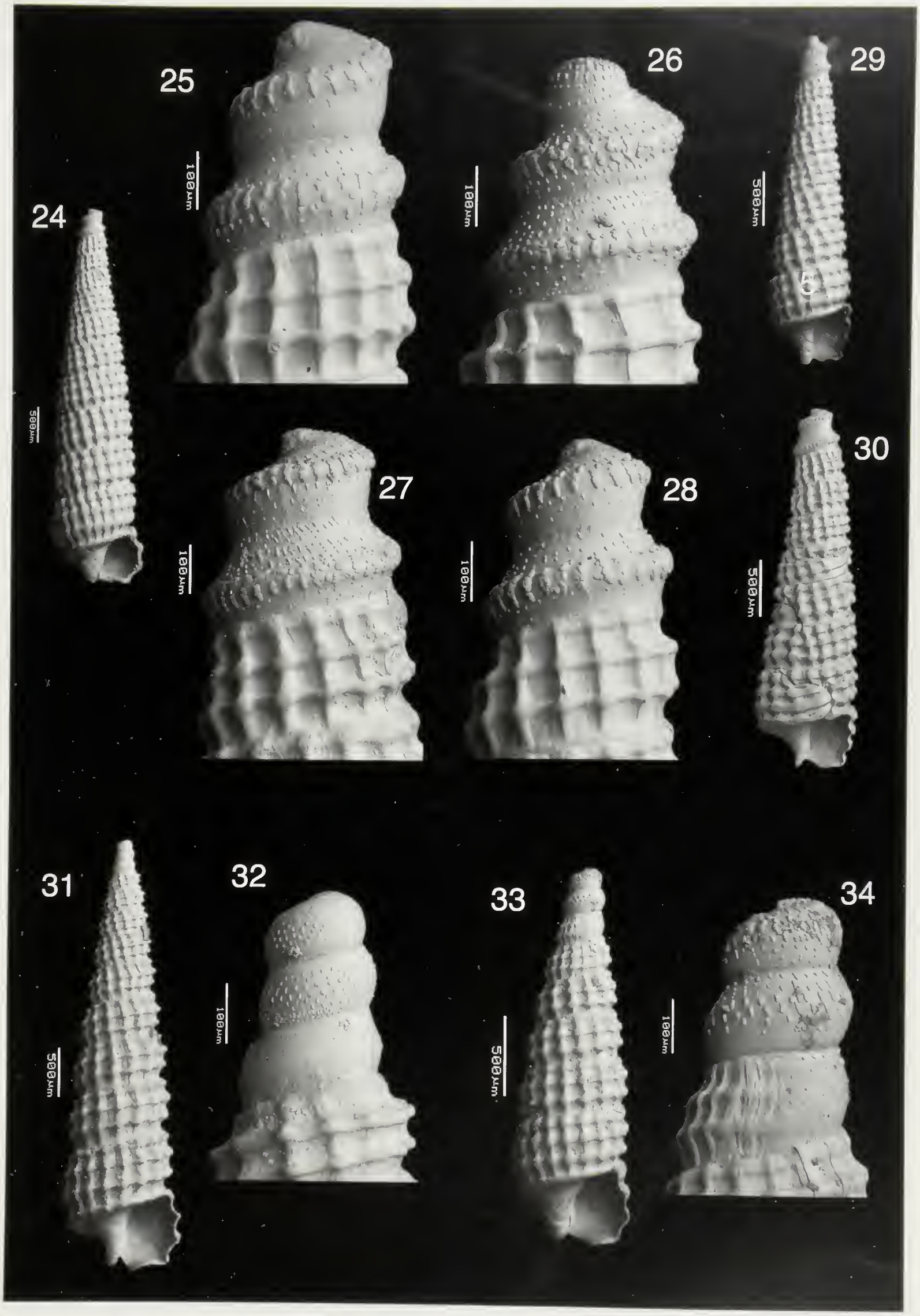
Type material. Holotype, MNHN (n° Moll 26470), dim. 1.67 x 0.77 mm, protoconch. 0.22 x 0.19 mm, RAPA 2002, stn 6.
Paratype 1 - MNHN (n° Moll 26471), dim. 1.52 x 0.68 mm, without protoconch. RAPA 2002, stn 6.

Type locality. Austral Is., Rapa, off Ahurei bay, 42 m, 27°36.8'S, 144°16.7'W, living and dead coral, 05 nov. 2002.

Material examined. French Polynesia, Austral Is.: Rapa, stn 6, off Ahurei bay, 2 spms, 42 m, 27°36.8'S, 144°16.7'W, living and dead coral, 05 nov. 2002 (holotype MNHN, 1 paratype MNHN).

Figures 24 – 34

24 - 30. *Australopsis floresi* n. sp., Austral Is., Rapa. **24-25**. Holotype MNHN (n° Moll. 26460), 2-8 m [stn 34, Cave at SE Tematapu point], 5.40 x 1.37 mm, protoconch 0.42 x 1.77 mm; **26**, **29**. Paratype 1, MNHN (n° Moll. 26461), 6 m [stn 27, SW Gotenaonao point], 4.60 x 1.35 mm, protoconch 0.42 x 0.32 mm; **27**, **30**. Paratype 2, MNHN (n° Moll. 26462), 2-8 m [stn 34, Cave at SE Tematapu point], 4.65 x 1.26 mm, protoconch 0.43 x 0.35 mm; **28**. Paratype 3, MNHN (n° Moll. 26462), 2-8 m [stn 34, Cave at SE Tematapu], protoconch 0.42 x 0.37 mm; **31 - 32**. *Clathropsis payriae* n. sp., Austral Is., Rapa, holotype MNHN (n° Moll. 26466), 15-20 m, [stn 32, Vavai], 4.40 x 1.25 mm, protoconch 0.37 x 0.22 mm.
33 - 34. *Clathropsis tuanainaii* n. sp., Austral Is., Rapa, holotype MNHN (n° Moll. 26464), 15-20 m, [stn 36, Kauria point], 2.32 x 0.75 mm, protoconch 0.46 x 0.27 mm.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Description of the holotype. Shell very small, oval with constricted base; suture not very distinct. Protoconch very short, near cylindrical of 2.5 smooth convex whorls; apex rounded showing, under SEM, very minute granulation; last whorl partially submerged in first whorl of teleoconch. Colour white, opaque. Teleoconch of 4.5 whorls. Reticulate sculpture of 3 spiral cords, about equal in strength, crossed by weaker axial ribs, about 16 on last whorl. Strong beads at each intersection with spiral cords. In last whorl first spiral is slightly stronger and fourth narrower beaded spiral at base. Columella short and broad, obliquely truncate, divided from last whorl with cord, surface crossed by many crisp growth lines. Columellar callus bordering sub-circular aperture; anal sulcus and siphonal canal wide and well defined. Colour yellow.

Remarks. *Joculator bouteti* n. sp. shows a very short protoconch, typical of the genus *Specula*, but its outline is clearly typical of the genus *Joculator*. It is compared with some similar species, *J. minutus*, *J. gemmae*, *J. luteolus*, *J. perlucidus*, *J. recisus* and *J. priorai*, all from Central Philippines (see Cecalupo & Perugia, 2012) with, obviously, a main difference in the protoconch. The protoconch of *J. bouteti* n. sp. is very like to *Specula fragilis* Cecalupo & Perugia, 2012 but easily distinguishable by its more conical, turreted teleoconch with a wider suture.

Etymology. Dedicated to Michel Boutet of Tahiti.

Joculator itiensis n. sp.
Figs 8, 39-40

Type material. Holotype - MNHN (n° Moll 26472), dim. 1.95 x 0.85 mm, protoconch 0.25 x 0.18 mm, RAPA 2002 stn 11.
Paratype 1 - MNHN (n° Moll 26473), dim. 1.78 x 0.78 mm, protoconch 0.22 x 0.20 mm, RAPA 2002, stn 11.
Paratype 2 - MNHN (n° Moll 26473), dim. 1.98 x 0.95 mm, protoconch 0.25 x 0.18 mm, RAPA 2002, stn 11.
Paratype 3 - MNHN (n° Moll 26474), dim. 1.55 x 0.76 mm, protoconch 0.23 x 0.18 mm, RAPA 2002, stn 41.
Paratype 4 - MNHN (n° Moll 26473), dim. 1.70 x 0.80 mm, protoconch 0.22 x 0.18 mm, RAPA 2002, stn 11.
Paratype 5 - MNHN (n° Moll 26473), dim. 1.65 x 0.73 mm, protoconch 0.20 x 0.17 mm, RAPA 2002, stn 11.
Paratype 6 - MNHN (n° Moll 26473), dim. 1.71 x 0.70 mm, protoconch 0.23 x 0.16 mm, RAPA 2002, stn 11.

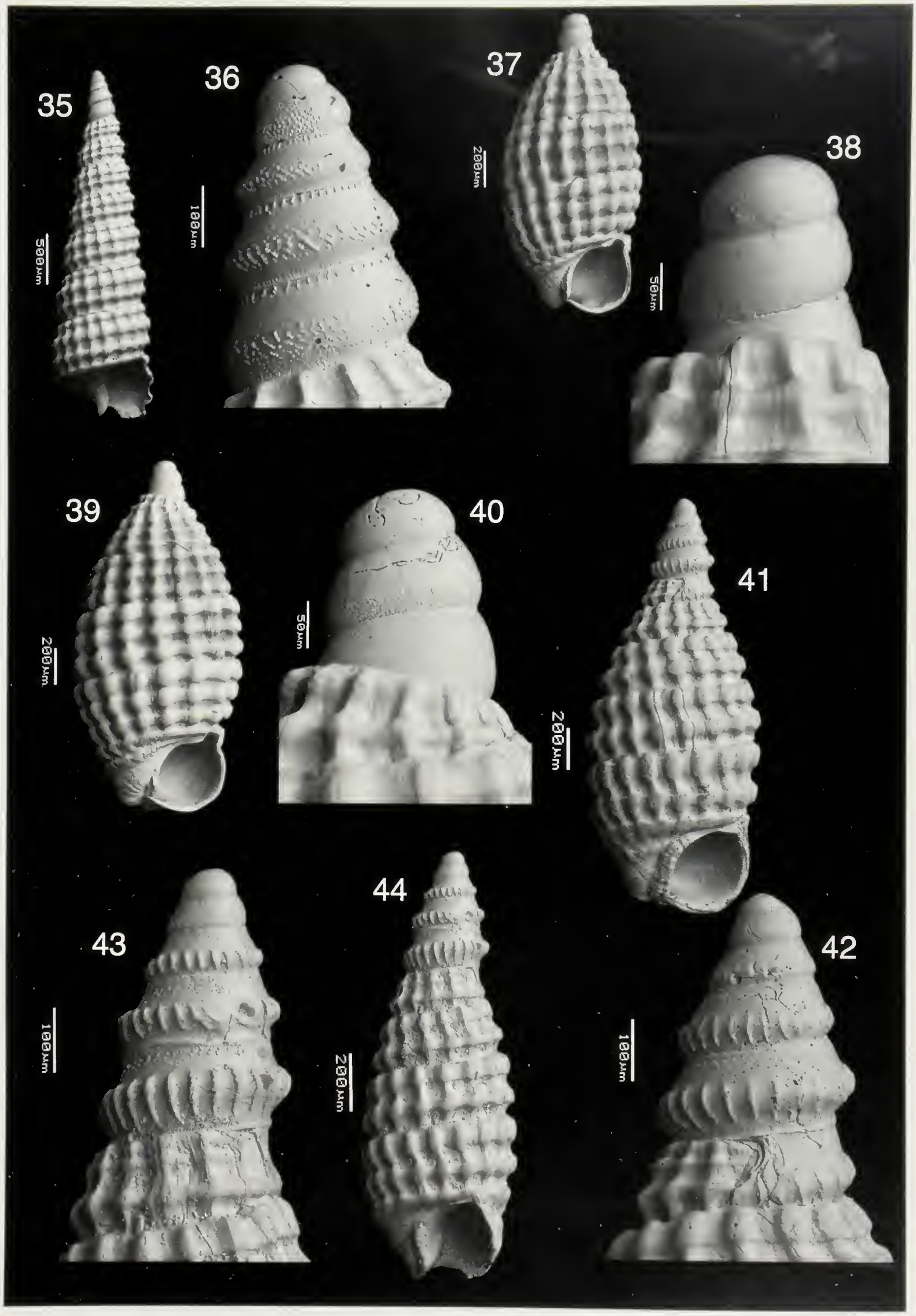
Type locality. Austral Is., Rapa (Rapa Iti), 1 spm, 2 m, 27°37.2'S, 144°18.2'W, small sandy zones on flat rocky bottom et dead coral, 07 nov. 2002.

Material examined. French Polynesia, Austral Is.: Rapa, stn 4, Rarapai Is., 5 spms, 18 m, 27°34.3'S, 144°22.1'W, heap of stones covered with brown algae, 04 nov 2002; stn 6, off Baie Ahurei, 4 spms, 16-20 m, 27°36.8'S, 144°16.7'W, living and dead coral, 05 nov 2002; stn 11, N Rapa Iti Is., 1 spm, 2 m, 27°37.2'S, 144°18.2'W, small sandy zones on flat rocky bottom et dead coral, 07 nov. 2002 (holotype MNHN, 5 paratypes MNHN); stn 16, W Tauna Is., 6 spms, 5 m, 27°36.3'S, 144°18.4'W, mainly dead coral, 09 nov 2002; stn 25, Baie Anatakuri Nako, 4 spms, 3 m, 27°38.4'S, 144°18.9'W, blocks of dead coral sandy area, 13 nov 2002; stn 28, Pointe Taekateke, 4 spms, 30 m, 27°38.4'S, 144°20.6'W, lot of stones covered with algae, 15 nov. 2002; stn 30, Pointe Mei, 3 spms, 16-20 m, 27°38.2'S, 144°18.2'W, coral mort on drop off, 16/18 nov. 2002; stn 32, Vavai, 13 spms, 15-20 m, 27°35.0/35.8'S, 144°22.7/23.0'W, coral, 18/23 nov 2002; stn 33, Pointe Teruametitoi, 10 spms, 30 m, 27°34.8'S, 144°18.6'W, dead coral, 19 nov. 2002; stn 36, Pointe Kauria, 18 spms, 27 m, 27°33.5'S, 144°20,8'W, mainly living coral, 21 nov 2002; stn 41, Baie Anarua, 2 spms, 5 m, 27°36.3'S, 144°22.7'W, coral heads on sandy bottom, 25 nov 2002 (1 paratype MNHN); stn 44, NW Tauna Is., 6 spms, 30 m, 27°36.3'S, 144°18.2'w, drop off with muddy zones, 27 nov. 2002; stn 47, Baie Ahurei, 4 spms, 33 m, 27°36,7'S, 144°19,1'W, mud with coral heads, 29 nov. 2002; stn 48, off Pointe Rukuaga, 6 spms, 36 m, 27°34.1'S, 144°22.1'W, plateau covered by sand, 30 nov. 2002.

Description of the holotype. Shell very small, oval in shape with constricted base, suture moderately impressed. Protoconch short, conical of 3.5 convex whorls, smooth with exception, seen under SEM, for adapical narrow band of microgranules in first 2 whorls; apex rounded. Last whorl partially submerged in first whorl of teleoconch. Colour whitish.

Figures 35 - 44.

35 - 36. *Clathropsis peculiaris* n. sp., Society Is., holotype MNHN (n° Moll. 26465), 15-20 m, [TARASOC, stn DW3442], 3.45 x 1.10 mm, protoconch 0.59 x 0.27 mm; **37 - 38**. *Joculator itiensis* n. sp., Austral Is., holotype MNHN (n° Moll. 26472), 2 m, [stn 11, N Rapa Iti Is.], 1.95 x 0.85 mm, protoconch 0.25 x 0.18 mm; **39 - 40**. *Joculator bouteti* n. sp., Austral Is., holotype MNHN (n° Moll. 26470), 2 m, [stn 6, Rapa Is.], 1.67 x 0.77 mm, protoconch 0.22 x 0.19 mm; **41 - 42**. *Marshallopsis bazzocchii* n. sp., Marquises Is., holotype MNHN (n° Moll. 26475), 2 m, [stn DR1247, Fatu Hiva Is.], 2.02 x 0.82 mm, protoconch 0.50 x 0.30 mm; **43 - 44**. *Marshallopsis letourneuxi* n. sp., Marquises Is., holotype MNHN (n° Moll. 26476), 68 m, [Ua Pou Haakuti], 1.47 x 0.56 mm, protoconch 0.50 x 0.30 mm.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Teleoconch of 5 whorls. Sculpture of 3 spiral cords (second narrower) crossed by wider axial ribs, 16 on last whorl. Strong beads at each intersection with spiral cords. Another beaded cord is at base of last whorl. Columella short and broad divided from columella by fourth cord and with surface crossed by many thin crisp folds. Ridge bordering sub-circular aperture. Anal sulcus and wide siphonal canal well defined. Colour red brown, first whorl and columella pale yellowish.

Remarks. *Joculator itiensis* n. sp. is a shell with a typical outline of *Joculator* and can be compared with many species from Central Philippines (Cecalupo & Perugia, 2012) as: *J. fuscus*, *J. furvus*, *J. ater*, *J. carpatinus*, *J. caliginosus*, *J. obscurus*, all with similar colour but different protoconch and *J. minutus*, *J. pygmaeus*, *J. perlucidus*, *J. drivasi*, *J. recisus*, that have a different colour. It is also compared with *J. lazzarii* and *J. granulosus* Cecalupo & Perugia. 2013 from Vanuatu Is.: both have a different teleoconch, the first is more constricted at the base and a larger protoconch, the second has a protoconch of 4.5 whorls and an oval elongated teleoconch.

Etymology. From the type locality.

Genus ***Marshallopsis*** Cecalupo & Perugia, 2012
Type species: *Marshallopsis albachiarae* Cecalupo & Perugia, 2012. Bohol Is., Philippines.

Marshallopsis bazzocchii n. sp.
Figs 10, 41-42

Type material. Holotype - MNHN (n° Moll 26475), dim. 2.02 x 0.82 mm, protoconch 0.50 x 0.30 mm, MUSORSTOM 9, stn DR1247.

Type locality. Marquesas Is., Fatu Hiva, 1150-1250 m, 10°34'S, 138°42'W, 01 nov. 1997.

Material examined. French Polynesia, Marquesas Is.: Fatu Hiva, N/O "Alis" campagne MUSORSTOM 9, stn DR1247, 1 spm, 1150-1250 m, 10°34'S, 138°42'W, 01 nov. 1997 (holotype MNHN)

Description of the holotype. Shell very small, oval elongated with constricted base. Protoconch conical, acute of 5-5.5 convex whorls with rounded apex. Showing under SEM first 1.5 apical whorls are smooth, next whorls are smooth in upper half where showing narrow band of weak grains under suture while lower half is crossed by thin axial prosoclinc riblets (16-18 per whorl). Last whorl partly submerged in first whorl of teleoconch. Colour yellowish, opaque. Teleoconch of 4.5-5 whorls; suture moderately impressed. Reticulate sculpture of 2 about equal spiral cords crossed by narrower axial ribs, 16 on last whorl. Strong bead at each intersection with spiral cords. Fourth beaded cord at base of last whorl. Columella short and broad with weak cord and surface crossed by thin threads. Clear ridge bordering sub-circular aperture; siphonal canal wide and well defined. Colour orange with first spiral cord darker.

Remarks. *Marshallopsis bazzocchii* n. sp. is compared with *M. atrata* Cecalupo & Perugia, 2012 from Central Philippines: same protoconch but teleoconch with 3 spiral cords vs 2 and darker in colour.

Etymology. Dedicated to Piero Bazzocchi member of the "Gruppo Malacologico Romagnolo", Pesaro, Italy.

Marshallopsis letourneuxi n. sp.
Figs 12, 43-44

Type material. Holotype - MNHN (n° Moll. 26476) dim. 1.47 x 0.56 mm, protoconch 0.50 x 0.30 mm. Paratype 1 - MNHN (n° Moll. 26477) dim. 1.45 x 0.54 mm, protoconch 0.50 x 0.30 mm.

Type locality. Marquesas Is., Ua Pou, Haakuti, 68 m.

Material examined. French Polynesia, Marquesas Is.: Ua Pou, Haakuti, 68 m, 2 spms, ex coll. Letourneux. (holotype MNHN, 1 paratype MNHN).

Description of the holotype. Shell conical, very small, suture impressed, base slightly constricted. Protoconch conical of 5.5 convex whorls. Under SEM: 1.5 apical whorls smooth, next whorls smooth in upper half and with regularly spaced fine riblets in lower half, about 18 in last whorl. Suture marked by fine cord and weak grains. Colour yellowish. Teleoconch conical of 4 whorls with reticulate sculpture of 2 spiral cords (first stronger in last whorl) crossed by narrower axial ribs (about 16 on last whorl). Beads at each intersection with spiral cords. Fourth smooth beaded cord at base of last whorl emerging of insertion of outer lip. Columella short with spiral cord and crossed by many growth lines; clear ridge bordering aperture; siphonal canal well defined. Colour dark orange.

Remarks. This shell could be a juvenile specimen and can be confused with *Synthopsis praeacuta* Cecalupo & Perugia, 2012 from which it differs mainly by the sculpture of the protoconch.

Etymology. Dedicated to Jean Letourneux of Tahiti.

Marshallopsis tahitiensis n. sp.
Figs 13, 45-46

Type material. Holotype - MNHN (n° Moll. 26478) dim. 1.85 x 0.90 mm, protoconch 0.43 x 0.24 mm.

Type locality. Tahiti, Afaahiti, sediment, 30-60 m.

Material examined. French Polynesia, Society Is.: Tahiti, Afaahiti, sediment, 30/60 m, 6 spms, protoconch broken, Jun. 1985 ex coll. Tröndlé. (holotype MNHN).

Description of the holotype. Shell with incomplete aperture, very small, oval, suture moderately impressed, base constricted. Protoconch conical of 4-4.5 convex whorls. Under SEM: 1.5 apical whorls smooth, next whorls smooth in upper half and with regularly spaced fine prosocline riblets in lower half, about 18 in last whorl. Suture marked by fine cord. Colour yellowish. Teleoconch conical of 5 whorls with reticulate sculpture of 2 spiral cords (first very stronger and axially elongated in last whorl) crossed by axial ribs (about 18-19 on last whorl). Beads at each intersection with spiral cords. Fourth smooth narrow cord at base of last whorl emerging of insertion of outer lip. Columella short with spiral cord and crossed by many growth lines; clear ridge bordering aperture; outer lip broken. Colour yellowish, with second spiral cord orange.

Remarks. This species is compared with *Marshallopsis jolandae* Cecalupo & Perugia, 2013 from Vanuatu. The examined sample of *M. tahitiensis* is smaller in size with an oval feature but the main difference is the colour, having the second spiral cord of teleoconch orange while *M. jolandae* has the first red brown. Other shells with similar colour are *Horologica mariani*, *H. splendida* and *Joculator ziliolii* all of Cecalupo & Perugia, 2012 from Central Philippines, easily distinguishable by having a smooth protoconch.

Etymology. From the type locality.

Marshallopsis troendlei n. sp.
Figs 11, 47-48

Type material. Holotype - MNHN (n° Moll. 26479) dim. 1.88 x 0.84 mm, protoconch 0.39 x 0.25 mm.

Type locality. Tahiti, Arue, Récif du Tombeau du Roi, 22 may 1982.

Material examined. French Polynesia, Society Is.: Tahiti, Arue, Récif du Tombeau du Roi, 1 spm, 22 may 1982, ex coll. Tröndlé (holotype MNHN).

Description of the holotype. Shell oval, very small, suture moderately impressed, base constricted. Protoconch conical of 3.5 convex whorls. Under SEM: apical whorl with an irregular granulation, next whorls smooth in upper 3/4 and with band of regularly spaced fine riblets in lower part, about 20 in last whorl. Colour yellowish. Telcoconch conical of 5 whorls with reticulate sculpture of 2 spiral cords (first stronger and, in last whorl, divided by furrow) crossed by narrower axial ribs (about 14 on last whorl). Beads at each intersection with spiral cords. Fourth smooth beaded cord at base of last whorl emerging of insertion of outer lip. Columella short with clear spiral cord and crossed by many growth lines; ridge bordering aperture; siphonal canal and anal sulcus well defined. Colour pale brown with first 2 whorls and columella yellowish.

Remarks. Similar in colour to *Joculator alligatus* Cecalupo & Perugia, 2012 from the Philippines and *J. itiensis*, here reported from French Polynesia, but it is smaller then *J. alligatus* and has a completely different protoconch from both species.

Etymology. Dedicated to Jean Tröndlé of La Force (France).

Genus *Prolixodens* Marshall B.A., 1978
Type species: *Cerithiopsis infracolor* Laseron, 1951. Off Long Reef, NSW, Australia.

Prolixodens proxima n. sp.
Figs 14, 49-50

Type material. Holotype - MNHN (n° Moll 26480), dim. 5.30 x 1.50 mm, protoconch 0.62 x 0.27 mm, MUSORSTOM 9, stn DW1222.
Paratype 1 - MNHN (n° Moll 26481), dim. 2.25 x 0.72 mm, protoconch 0.62 x 0.27 mm, MUSORSTOM 9, stn DR1200.
Paratype 2 - MNHN (n° Moll 26482), dim. 4.10 x 1.25 mm, protoconch 0.62 x 0.26 mm, Atelier MARQUISES 1997, stn 24 bis.

Type locality. Marquesas Is., Hiva Oa, 340-352 m, 9°44'S, 138°51'W, 30, aug. 1997.

Material examined. French Polynesia, Marquesas Is.: Hiva Oa, N/O "Alis" campagne MUSORSTOM 9, stn DR1200 1 spm, 340-352 m, 9°44'S, 138°51'W, 30 aug. 1997 (holotype MNHN); stn DR1200, 1 spm, 96-100 m, 9°49.9'S, 139°08.9'W, 28 aug. 1997; Atelier MARQUISES 1997 (1 paratype MNHN); stn 24 bis, NW coast of Baie Haahue, 1 spm, 20-34 m, 8°53.60'S, 139°37.00'W, sandy bottom, 10 oct. 1997 (1 paratype MNHN).

Description of the holotype. Shell of medium size, conical with convex regularly increasing whorls, turreted, base excavate. Protoconch acute, conical of 4.5 smooth, convex whorls. Under SEM: 1.5 apical whorls granulate, suture defined by thin cord with 2 series of small grains, those adapical more minute. Next whorls are smooth in upper one-third and with regularly spaced fine prosocline riblets in lower two-thirds. Colour whitish, semitransparent. Teleoconch of 9 convex whorls with well impressed suture. Reticulate sculpture of 3 main equal spiral cords (first immediately under suture) crossed by axial ribs of same strength (about 22 on last whorl). Squared

tubercles at each intersection with spiral cords. Under SEM: limit between base and columella highlighted by weak groove. Another narrow spiral cord at base of last whorl. Columella short, acuminate; outer lip thin, indented by sculpture, siphonal canal open, well defined. Colour whitish, suture and first spiral yellowish.

Remarks. For the sculpture of the protoconch it is compared with *Prolixodens captiosa* Cecalupo & Perugia, 2012 from Central Philippines. *P. proxima* n. sp. has a shorter protoconch, a teleoconch with a less open suture; the shell is also less slender, reaching a larger diameter in width. In those two species the protoconch has a different sculpture from the diagnosis of the genus *Prolixodens* (Marshall, 1978) "Subsequent whorls with granules on shoulder and fine, crisp, regularly spaced riblets on prosocline sides." (add riblets from suture to suture). Even the base "Base fairly evenly contracted at maturity, smooth." looks different and does not present any contraction in our species. We consider provisional the assignment to the genus *Prolixodens*.

Etymology. Latin *proxima*, for its resemblance with ?*Prolixodens captiosa*.

Genus ***Seila*** A. Adams, 1861
Type species: *Triphoris dextroversus* A. Adams & Reeve, 1850. China seas.

Seila retusa n. sp.
Figs 16, 53-54

Type material. Holotype - MNHN (n° Moll 26483), dim. 3.65 x 1.05 mm, protoconch 0.45 x 0.50 mm, TARASOC, stn DW3373. Dead sample.

Type locality. Tuamotu Is, Kaukura, 507-607 m, 15°41'S, 148°54'W, 04 oct. 2009.

Material examined. French Polynesia, Tuamotu Is.: Kaukura, N/O "Alis" campagne TARASOC, stn DW3373, 1 spm, 507-607 m, 15°41'S, 148°54'W, 04 oct. 2009 (holotype MNHN).

Description of the holotype. Shell medium in size, conical with flat sides, suture not easily discernible, colour opaque white. Protoconch of lecithotrophic larval type, blunt-tipped, merging insensibly into teleoconch but of about 2.5 whorls, conical with same inclination of teleoconch and sculptured with one prominent median smooth spiral carinae; dim. about 0.43 x 0.50 mm. Teleoconch of 7 whorls, sculptured with three prominent smooth spiral carinae, second very narrower. Showing under SEM at base of last whorl, two other thin spiral emerging from suture; in intervals between carinae very thin, close-set axial lamellae; limit between base of shell and columella highlighted by groove. Columella short, obliquely truncated; aperture sub-circular with siphonal canal wide.

Remarks. Few species can be compared with *Seila retusa* n. sp.: *Seila (Lyroseila) cincta* (Hutton, 1885) from N. Zealand, a species living between 6 and 30 m depth, illustrated by Marshall (1978), has a flatter protoconch, a more conical teleoconch and a different colour (reddish to yellowish brown). Hutton (1885) included *S. cincta* in the genus *Bittium*. *Seila (Lyroseila) dilecta* Marshall, 1978, from New Zealand, living in a greater depth, up to 805 m, has a similar outline to *S. retusa* n. sp. but a different colour (yellowish brown, spiral cords white) and a more rounded, not blunt-tipped protoconch.

Etymology. Latin *retusa*, for the apical truncated form.

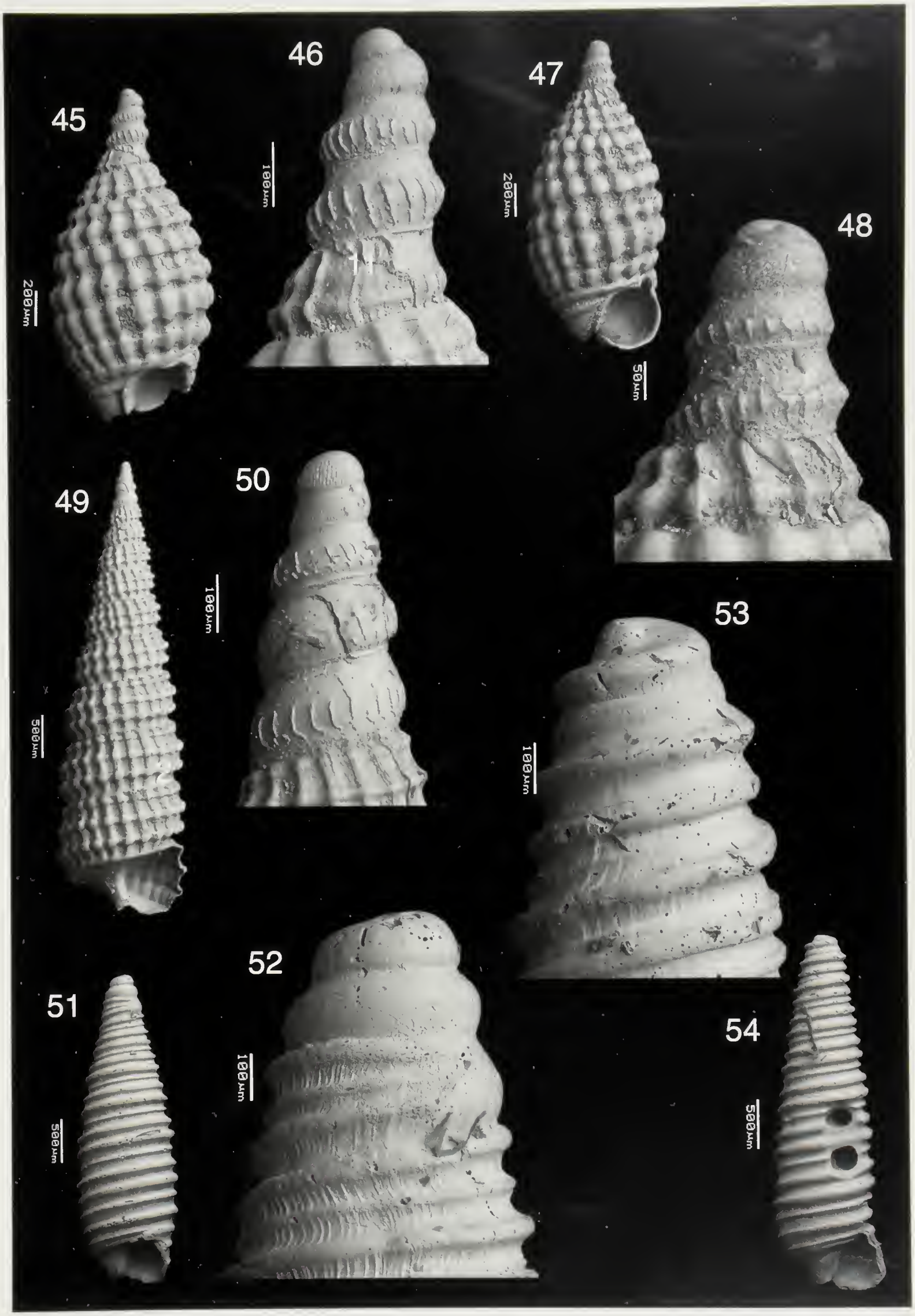
Seila societatis n. sp.
Figs 15, 51-52

Type material. Holotype - MNHN (n° Moll 26484), dim. 3.65 x 1.22 mm, protoconch 0.47 x 0.40 mm, TARASOC, stn DW3374. Dead sample.

Type locality. Society Is., Moorea, 720 m, 17°28'S, 151°26'W, 21 oct. 2009.

Figures 45 - 54.

45 - 46. *Marshallopsis tahitiensis* n. sp., Tahiti Is., holotype MNHN (n° Moll. 26478), 30-60 m, [Afaahiti], 1.85 x 0.90 mm, protoconch 0.43 x 0.24 mm; **47 - 48**. *Marshallopsis trondlei* n. sp., Tahiti, holotype MNHN (n° Moll. 26479), [stn DR1247, Tahiti Is. Arue], 1.88 x 0.84 mm, protoconch 0.39 x 0.25 mm; **49 - 50**. *Prolixodens proxima* n. sp., Marquises Is., holotype MNHN (n° Moll. 26480), 340-352 m, [Hiva Oa Is.], 5.30 x 1.50 mm, protoconch 0.62 x 0.27 mm; **51 - 52**. *Seila societatis* n. sp., Society Is., holotype MNHN (n° Moll. 26484), 720 m, [TARASOC, stn DW3474, Moorea], 3.65 x 1.22 mm, protoconch 0.47 x 0.40 mm; **53 - 54**. *Seila retusa* n. sp., Tuamotu Is., holotype MNHN (n° Moll. 26483), 507-607 m, [TARASOC, stn DW3373, Kaukura], 3.65 x 1.05 mm, protoconch 0.45 x 0.50 mm.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Material examined. French Polynesia, Society Is.: Moorea, N/O "Alis" campagne TARASOC, stn DW3474, 1 spm, 720 m, 17°28'S, 151°26'W, 21 oct. 2009 (holotype MNHN).

Description of the holotype. Shell medium in size, conical with slightly constricted base, suture indistinct, colour opaque white, probably yellowish in fresh samples. Protoconch short of 2.5 smooth, convex whorls. Teleoconch of 7 whorls with spiral sculpture of 3 smooth spiral cords (adapical cord stronger, second very narrower). Under SEM: fine very close-set axial lamellae in their intervals, well distinct. Limit between base of shell and columella highlighted by groove. At base of last whorl other two thin spirals emerging from suture. Columella short and broad, obliquely truncate. Aperture and outer lip damaged.

Remarks. *Seila societatis* n. sp. is compared with *Seila (Lyroseila) dilecta* Marshall, 1978 and *Seila (Lyroseila) cincta* (Hutton, 1885) both from New Zealand; it is easily distinguished by having a smooth protoconch without keels.

Etymology. From the type locality.

Genus ***Synthopsis*** Laseron, 1956
Type species: *Synthopsis cylindrica* Laseron, 1956. Michaelmas Cay, Qld, Australia.

Synthopsis rapaensis n. sp
Figs 17, 55-56

Type material. Holotype - MNHN (n° Moll 26485), dim. 3.60 x 1.05 mm, protoconch 0.50 x 0.26 mm, RAPA 2002, stn 34.
Paratype 1 - MNHN (n° Moll 26486), dim. 3.55 x 1.00 mm, protoconch 0.50 x 0.21 mm, RAPA 2002, stn 44.
Paratype 2 - MNHN (n° Moll 26486), dim. 3.70 x 1.15 mm, protoconch 0.50 x 0.22 mm, RAPA 2002, stn 44.
Paratype 3 - MNHN (n° Moll 26487), dim. 4.00 x 1.05 mm, protoconch 0.50 x 0.23 mm, RAPA 2002, stn 44.

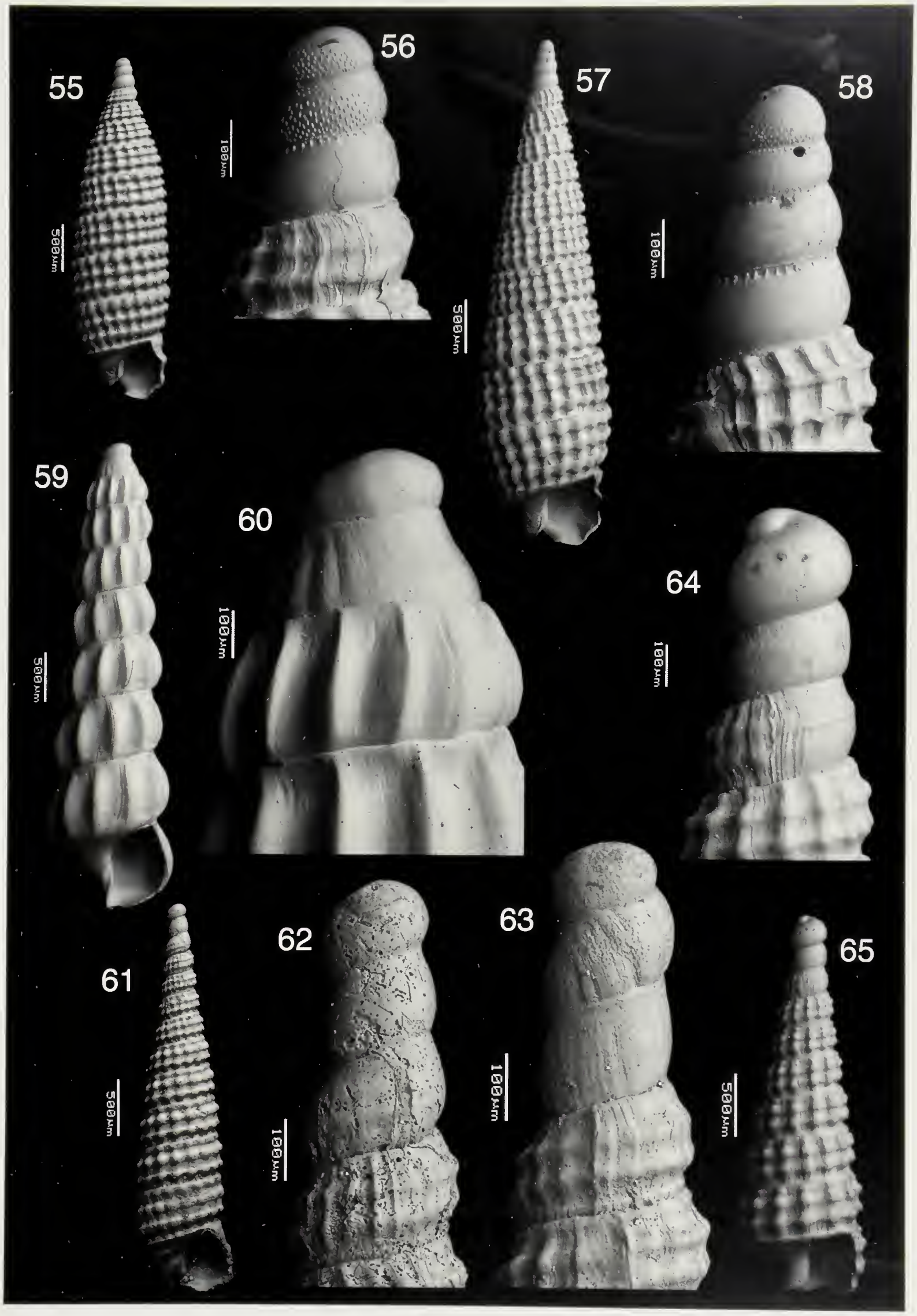
Type locality. Austral Is., Rapa, cave SE Pointe Tematapu, 26 spms, 2-8 m, 27°34,8'S, 144°19.0'W, falling inside large cave, muddy bottom, 19 nov. 2002.

Material examined. French Polynesia, Austral Is.: Rapa, stn 4, Rarapai Is., 1 spm, 18 m, 27°34.3'S, 144°22.1'W, blocks of coral covered with brown algae, 04 nov. 2002; stn 8, S/E Tauna Is, 5 spms, depth 52-57 m, 27°36.5'S, 144°17.7'W, on sandy area, 06 nov. 2002; stn 16, W Tauna Is., 1 spm, 5 m, 27°36.3'S, 144°18.4'W, manly dead coral, 09 nov. 2002; stn 21, E Baie Tupuaki, 4 spm, 5 m, 27°34.2'S, 144°20.6'W, blocks of dead coral on sandy bottom, 12 nov. 2002; stn 25, Baie Anatakuri Nako, 6 spms, 3 m, 27°38.4'S, 144°18.9'W, blocks of dead coral on sandy zones, 13 nov. 2002; stn 32, Vavai, 1 spm, 15-20 m, 27°35.0/35.8'S, 144°22.7/23.0'W, coral, 18/23 nov. 2002; stn 34, cave SE Pointe Tematapu, 26 spms, 2-8 m, 27°34,8'S, 144°19.0'W, falling inside large cave, muddy bottom, 19 nov. 2002 (holotype MNHN); stn 38, N Baie Anatakuri, 1 spm, 2 m, 27°37.4'S, 144°18.4'W, sediment on big rock, 22 nov. 2002; stn 44, NW Tauna Is., 27 spms, 30 m, 27°36.3'S, 144°18.2'W, drop off with muddy zones, 27 nov. 2002 (3 paratypes MNHN); stn 47, Baie Ahurei, 5 spms, 33 m, 27°36,7'S, 144°19,1'W, mud with coral heads, 29 nov. 2002; stn 67, Baie Pariati, 1 spm, 3-4 m, 27°34.7'S, 144°21.7'W, sand, mud and algae, 18 nov. 2002.

Description of the holotype. Shell medium in size, nearly cylindrical with slightly constricted base. Protoconch conical of 3.5 convex whorls. Under SEM: apex rounded, initially smooth then with fine granulation extended to lower part of second whorl, roughly arranged in 6-7 lines; suture marked by minute grains. Colour opaque white, suture orange. Teleoconch of 8 whorls, suture moderately impressed. Reticulate sculpture of 3 spiral cords (second lightly narrower) crossed by weaker axial ribs, 18-19 on last whorl, adapical spiral cord larger. Strong beads at each intersection with axial ribs. Another beaded cord at base of last whorl. Under SEM: intervals between spirals crossed by thin close-set axial threads; limit between base of shell and columella is highlighted by clear groove. Columella short and broad, obliquely truncate, with surface crossed by growth lines throughout. Columellar callus bordering sub-circular aperture with wide siphonal canal well defined. Ground colour orange with first spiral cord white.

Figures 55 – 65

55 - 56. *Synthopsis rapaensis* n. sp., Austral Is., Rapa, holotype MNHN (n° Moll. 26485), 2-8 m, [stn 34, SE Tematapu], 3.60 x 1.05 mm, protoconch 0.50 x 0.26 mm; **57 - 58**. *Synthopsis vavaiensis* n. sp., Austral Is. Rapa, holotype MNHN (n° Moll. 26493), 15-20 m, [stn 32, Vavai], 4.44 x 1.28 mm, protoconch 0.52 x 0.25 mm; **59 - 60**. *Eumetula albachiarae* n. sp., Tuamotu Is., Rapa, holotype MNHN (n° Moll. 26491), 462-980 m, [TARASOC, stn DW3359, Kaukura], 4.70 x 1.32 mm, protoconch 0.37 x 0.45 mm; **61 - 65**. *Cerithiella francescoi* n. sp., Tuamotu, Anaa Is. **61**. Holotype MNHN (n° Moll. 26488), 3.45 x 0.90 mm, **62**. Protoconch holotype 0.60 x 0.23 mm; **63**. Protoconch paratype 2, 0.60 x 0.22 mm; **64**. Protoconch Paratype 1, 0.60 x 0.27 mm; **65**. Paratype 1, MNHN (n° Moll. 26489), 507-607 m, [TARASOC, stn DW3373, Kaukura], 2.76 x 0.93 mm, protoconch 0.60 x 0.23 mm.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Remarks. *Synthopsis rapaensis* n. sp. is compared with *S. enzae* Cecalupo & Perugia, 2012 from Central Philippines. It is similar in size and colour, with the first spiral cords of the teleoconch white, but it differs in having a protoconch of 3.5 whorls, with sculpture of minute grains in the first two whorls, vs 4.5 elongated, smooth whorls in *S. enzae*.

Etymology. From the type locality.

Synthopsis vavaiensis n. sp.
Figs 18-19, 57-58

Type material. Holotype - MNHN (n° Moll. 26493) dim. 4.55 x 1.28 mm, protoconch 0.52 x 0.25 mm, RAPA 2002, stn 32.
Paratype 1 - MNHN (n° Moll. 26494) dim. 3.68 x 1.05 mm, protoconch 0.52 x 0.25 mm, RAPA 2002, stn 25.
Paratype 2 - MNHN (n° Moll 26495), dim. 3.60 x 1.00 mm, protoconch 0.50 x 0.25 mm, RAPA 2002, stn 44.
Paratype 3 - MNHN (n° Moll 26496), dim. 2.90 x 0.90 mm, protoconch 0.52 x 0.25 mm, RAPA 2002, stn 8.

Type locality. Austral Is., Rapa, Vavai,15-20 m, 27°35.0/35.8'S, 144°22.7/23.0'W, coral, 18/23 nov. 2002.

Material examined. French Polynesia, Austral Is.: Rapa, stn 5, south of Tarakoi Is., 1 spm, 8 m, 27°5.6'S, 14.4°18.5'W, dead coral with algae, muddy-sandy zones, 04 nov. 2002; stn 8, SE Tauna Is., 9 spms, 52-57 m, 27°36.5'S, 144°17.7'W, rocky bottom with sandy area, 06/22 nov. 2002 (1 paratype MNHN); stn 9, Baie Hiri, 2 spms, 3-24 m, 27°37.3'S, 144°22.2'W, coral, 06 nov. 2002; stn 10, Pointe Komire (+ 79 m), 1 spm, 16-18 m, 27°34.8'S, 144°22.8'W, stones covered with brown algae, 07 nov. 2002; stn 16, W Tauna Is., 1 spm, 5 m, 27°36.3'S, 144°18.4'W, mainly dead coral, 09 nov. 2002; stn 20, Vavai, 3 spms, 5 m, 27°35.4'S, 144°23.3'W, blocks of coral on sandy bottom, 12 nov. 2002; stn 25, Baie Anatakuri Nako, 1 spm, 3 m, 27°38.4'S, 144°18.9'W, blocks of dead coral on sandy area, 13 nov. 2002 (1 paratype MNHN); stn 32, Vavai, 2 spms, 15-20 m, 27°35.0/35.8'S, 144°22.7/23.0'W, coral, 18/23 nov. 2002 (holotype MNHN); stn 43, Baie Ahurei, 1 spm, 45 m, 27°36.8'S, 14.4°18.3'W, drop off with muddy bottom at the base, 26 nov. 2002; stn 34, cave SE Pointe Tematapu, 1 spm, 2-8 m, 27°34,8'S, 144°19.0'W, falling inside large cave, muddy bottom, 19 nov. 2002; stn 44, NW Tauna Is., 6 spms, 30 m, 27°36.3'S, 144°18.2'W, drop off with muddy zones, 27 nov. 2002
(1 paratype MNHN); stn 47, Baie Ahurei, 1 spm, 33 m, 27°36.7'S, 144°19.1'W, mud bottom with coral heads, 29 nov. 2002; stn 48, off Pointe Rukuaga, 1 spm, 36 m, 27°34.1'S, 144°22.1'W, platcau covered by sand, 30 nov. 2002.

Description of the holotype. Shell medium in size, perfectly conical with flat sides and constricted base. Ground colour orange. Protoconch slender, conical of 3.5 smooth convex whorls with same inclination of teleoconch. Apex spherical, seen under SEM with slight granulation. Teleoconch of 9.5 flat whorls. Suture moderately impressed. Reticulate sculpture of 3 spiral cords crossed by axial ribs, 18-19 on last whorl. Spirals and ribs of about equal strength; adapical spiral cord stronger on last whorl. Under SEM: thin close-set threads in intervals of spirals; limit between base of shell and columella highlighted by clear groove. Beads at each intersection of spiral cords with axial ribs. Another cord at base of last whorl emerging from suture. Columella short and broad, obliquely truncate, with surface crossed by many growth lines. Columellar callus bordering sub-circular aperture with wide and well defined siphonal canal.

Remarks. *Synthopsis vavaiensis* n. sp. is compared with *Cerithiopsis powelli* Marshall, 1978 from New Zealand which has a similar conical shape. The main difference is localized in the protoconch; *C powelli* shows a paler protoconch of 4.5-5 whorls with a sculpture from minute granules, on the first 1.5 embryonic whorls, to broken prosocline riblets on the last. In *S. vavaiensis* n. sp. the protoconch is of 3.5 smooth whorls with only the embryonic whorls slightly granulate and the sutures marked by a series of minute grains.

Etymology. From the type locality.

Family **NEWTONIELLIDAE** Korobkov, 1955

Genus ***Cerithiella*** Verrill, 1882
Type species: *Cerithium metula* Lovén, 1846. Bergen, Norway.

Cerithiella francescoi n. sp.
Figs 21-23, 61-65

Type material. Holotype - MNHN (n° Moll 26488), dim. 3.45 x 0.90 mm, protoconch 0.60 x 0.23 mm, Tuamotu Is., Anaa.
Paratype 1 - MNHN (n° Moll 26489), dim. 2.76 x 0.93 mm, protoconch 0.60 x 0.27 mm, Tuamotu Is., Kaukura, TARASOC, stn DW3373.
Paratype 2 - MNHN (n° Moll 26490), dim. 3.00 x 0.85 mm, protoconch 0.60 x 0.22 mm, Tuamotu Is., Anaa.

Type locality. Tuamotu Is., Anaa, sediment on the external beach.

Material examined. French Polynesia, Tuamotu Is.: Anaa, sediment on the external beach, 40 spms, coll. Tröndlé (holotype MNHN, 1 paratype MNHN); stn DW3373, Tuamotu Is., Kaukura, N/O "Alis", campagne TARASOC, 1 spm, 507-607 m, 15°41'S, 148°54'W, 04 oct 2009 (1 paratype MNHN).

Description of the holotype. Shell medium in size,

regularly conical with distinct suture, last whorl slightly constricted, light white in colour. Protoconch cylindrical of 2.5 smooth convex whorls, apex bulbous. Teleoconch of 9.75 convex whorls. Reticular sculpture of 3 spiral cords (adapical cord narrower) crossed by weaker axial ribs (about 16 on last whorl); strong rounded beads on each intersection. Distance between first 2 cords very small; fourth spiral cord emerging from outer lip. Columella short, separated from base of teleoconch by fifth smooth cord. Columellar callus bordering circular aperture; siphonal canal well defined, anal sulcus barely hinted, margin of outer lip little corroded.

Remarks. It is compared with *Cerithiella cucumiacea* (Hedley & Petterd, 1906) from Australia. The drawing of *C. cucumiacea* shows a more bulbous apex of 1.5 whorls, the suture of the teleoconch is indistinct and there is an obvious columellar fold, details that differentiate it from *Cerithiella francescoi* n. sp.

Etymology. Dedicated to Francesco, grandson of Alberto Cecalupo.

Genus ***Eumetula*** Thiele, 1912
Type species: *Eumetula dilecta* Thiele, 1912, by monotypy. Antarctic.

Eumetula albachiarae n. sp.
Figs 20, 59-60

Type material. Holotype - MNHN (n° Moll 26491), dim. 4.70 x 1.32 mm, protoconch 0.37 x 0.45 mm, TARASOC, stn DW3359.
Paratype 1 - MNHN (n° Moll 26492), dim. 4.45 x 1.25 mm, protoconch 0.37 x 0.45 mm, TARASOC, stn DW3373.
Paratype 2 - MNHN (n° Moll 26492), dim. 7.50 x 1.62 mm, protoconch 0.37 x 0.45 mm, TARASOC, stn DW3373.

Type locality. Tuamotu Is., Kaukura, 462-980 m, 15°57'S, 147°08'W, 01 oct. 2009.

Mateial examined. French Polynesia, Tuamotu Is.: Kaukura, N/O "Alis" campagne TARASOC. stn DW3359, 1 spm, 462-980 m, 15°57'S, 147°08'W, 01 oct. 2009 (holotype MNHN); stn DW3373, 2 spms, 507-607 m, 15°41'S, 146°54'W, 04 oct. 2009 (2 paratypes MNHN).

Description of the holotype. Shell slightly conical with convex regularly increasing whorls, distinct suture, vitreous, semitransparent, colourless. Protoconch very short of about 1.5 smooth whorls, not demarked from spire. Teleoconch of 7 convex whorls, smooth except for many fine growth lines, sculptured with 10 axial prominent ribs from suture to suture, rather orthocline. Aperture sub-circular, outer lip thin, columella acuminate, smooth.

Remarks. No comparable species from our bibliographical research.

Etymology. Dedicated to Albachiara, grand-daughter of Ivan Perugia.

OTHER MATERIAL EXAMINED FROM PRIVATE COLLECTIONS

These records extend the range distribution from the type locality up to French Polynesia.

Clathropsis multispirae Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Mahina, Baie de Matavai, 4 spms, 5 m, 01/1980 [Trn]; Tahiti, Mahina, Baie de Matavai, 20 m [Ltn]; Tahiti, Mahina, reef sediment, 3 spms, 06/1980 [Trn]; Tahiti, Mahina, Orofara, sediment on the beach, 1 spm [But]; Tahiti, Papenoo, 1 m [Ltn]; Moorea [Ltn]; Tahiti, Papara, rock brushing, 1 spm, 0.50 m, 30/11/89 [Trn]; Tetiaroa [Ltn]; Mehetia, 55 m, 20 spms [Ltn]; Tuamotu Is. - Rangiroa, Otepipi, sediment on external beach, 2 spms, 08/2001 [Trn]; Makemo, Passe Arikitamiro, sand under dead coral block, 1 spm, 1 m [Ltn].
Marquesas Is. - Ua Pou, Haakuti, 68 m, 4 spms; Ua Pou, Hakahetau 5 m [Ltn].

Clathropsis poppearum Cecalupo & Perugia, 2012

Type locality: Mactan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Arue, chanel, lagoon, 12 m [Ltn]; Tahiti, Arue, outer slope, 35 m [Ltn]; Tahiti, Mahina, Pointe Vénus, Banc du Dauphin, 9 spms, 18 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Clathropsis pulchella Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Mahina, Baie de Matavai, 20 m [Ltn]; Tahiti, Papenoo, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia, 55 m, 20 spms [Ltn].

Clathropsis zannii Cecalupo & Perugia, 2012

Type locality: Mactan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Arue, outer slope, 2 spms, 20-57 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia, [Ltn].

Horologica acuta Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Tuamotu Is. - Makemo, Pouheva reef, Arikitamiro, 1 m, sediment between dead coral blocks, 1 spm [Ltn].

Horologica alligata Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Tuamotu Is. - Rangiroa, near Passe de Tiputa, 1 spm, 100 m [Ltn].

Horologica diffusa Cecalupo & Perugia, 2012

Type locality: Cebu Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea[Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Horologica flava Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Bora Bora, sediment from outer slope of the reef barrier, 2 spms [But].

Horologica frauduleuta Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Tahiti, Faaone, reef along the coast, 28 spms, 23/05/85 [Trn]; Tahiti, Mitirapa, sediment on the beach, 2 spms [But]; Tahiti, Passe de Papeete, reef sediment, 20 spms, 1980/1981 [Ltn]; Tahiti, Punaauia, reef, 16 spms, 1980/81 [Ltn]; Tahiti, Mahina, Orofora, sediment on the beach, 3 spms, 01/2009 [Ltn]; Moorea [Ltn]; Mehetia [Ltn]; Tetiaroa, beach sediment [Ltn]; Bora Bora reef, 2 spms, 1 m [Ltn]; Tuamotu Is. - Hao, sediment on the external beach, 1 spm, 1981 [Ltn].

Horologica infuscata Cecalupo & Perugia, 2012

Type locality: Mactan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Papara, lagoon, sandy bowls near reef, 1 spm [But]; Tahiti, Mitirapa, sediment on the beach, 2 spms [But].

Horologica iucuuda Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu

French Polynesia: Soeicty Is. - Tahiti, Passe de Papeete, reef sediment, 3 spms, 01/1979 [Trn]; Tahiti, Arue, chanel, lagoon, 12 spms, 12 m [Ltn]; Tahiti, Mahina, Pointe Vénus, brushing on coral rocks, 1 spm, 11/1989 [Trn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn]; Tuamotu Is. - Makemo, Pohuc, 1 spm, 83 m [Ltn]; Anaa, sediment on external beach, 2 spms, 07/1980 [Trn]; Austral Is. - Rurutu, sandy sediment near reef, 51m [Ltn]; Raivavae, sandy sediment, lagoon, 2 spms [Ltn].

Horologica jayi Cecalupo & Perugia, 2012

Type locality: Mactan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Papara, Mahaiatea, reef blocks, 1 spm, 14/07/81 [Trn].

Horologica micaelae Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Austral Is., Rapa - stn 10, Pointe Komire, + 79 m, 1 spm, 16-18 m, 27°34,8'S, 144°22,8'W, heap of stones covered with brown algae, 07 nov 2002; stn 28, Pointe Taekateke, 1 spm, 30 m, 27°38,4'S, 144°20,6'W, lot of stones covered with algae, 15 nov 2002; stn 43, Baie Ahurei, 3 spms, 45 m, 27°36,8'S, 14,4°18,3'W, drop off with muddy bottom at the base, 26 nov 2002; stn 44, NW Tauna Is., 12 spms, 30 m, 27°36,3'S, 144°18,2'W, drop off with muddy zones, 27 nov 2002; stn 47, Baie Ahurei, 5 spms, 33 m, 27°36,7'S, 144°19,1'W, mud with coral heads, 29 nov 2002; stn 48, off Pointe Rukuaga, 3 spms, 36 m, 27°34,1'S, 144°22,1'W, plateau covered by sand, 30 nov 2002.

Horologica uodosa Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Papeete, Motu Uta, 2 m [Ltn]; Tahiti, Punaauia, outer slope, 20 m [Ltn]; Tahiti, Arue, outer slope, 15-60 m [Ltn]; Tahiti, Arue, lagoon, 10-18 m [Ltn]; Tahiti, Mahina, Baie de Matavai, 18 m [Ltn]; Tahiti, Mahaena, fringing reef [Ltn]; Tahiti, Tiarei, fringing reef, 1 m [Ltn]; Moorea, [Ltn]; Tetiaroa [Ltn], Mehetia, [Ltn].

Horologica paupercula Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Taravao, Port Phaeton, in sand along beachfront, 3 spms [But].

Horologica tabanellii Cecalupo & Perugia, 2012

Type locality: Mactan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia, [Ltn].

Horologica gweuaellae Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Tahiti, Arue, outer slope, 20-40 m [Ltn]; Tahiti, Mahina, Les roses de Matavai, 45 m, 4 spms [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator alligatus Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Punaauia, outer slope, 20 m [Ltn]; Tahiti, Arue, outer slope, 15-20 m [Ltn]; Tahiti, Arue, lagoon, 10-18 m [Ltn]; Tahiti, Tiarei, fringing reef, 1 m [Ltn]; Tahiti, Afaahiti, sediment, 3 spms, 30 m, 06/1985 [Trn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator arduinii Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Tuamotu Is. - Makemo, Pouheva, reef, 1 m, Passe Arikitamiro, 45 m [Ltn]; Ahe, sand on reef bord, 9 spms [Ltn].

Joculator carpatiuus Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Afaahiti, sediment, 7 spms, 30 m, 06/1985 [Trn].

Joculator furvus Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, fringing reef, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator inflatus Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator iauthiuus Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Austral Is. - Rapa, Hiri bay, 1 spm, 5 m [Ltn].

Joculator lividus Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.
French Polynesia: Society Is. - Tahiti, Punaauia, outer slope, 20 m [Ltn]; Tahiti, Arue, outer slope,15-20 m [Ltn]; Tahiti, Arue, lagoon, 10-18 m [Ltn]; Tahiti, Tiarei, fringing reef, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator minutus Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Afaahiti, sediment, 13 spms, 60 m, 06/1985 [Trn].

Joculator recisus Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Mahina, Pointe Vénus, Banc du Dauphin, 2 spms, 18 m [Ltn]. Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator simulans Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator subconicus Cecalupo & Perugia, 2012

Type locality: Pamilacan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Mitirapa, sediment on the beach, 2 spms [But].

Joculator pruuus Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Tahiti, Arue, outer slope, 1 spm, 20 m [Ltn]; Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Joculator variabilis Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Bora Bora, in sediment of the extreme point of the reef barrier, 2 spms [But].

Joculator voucoseli Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, outer slope, 1 spm, 65 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Marshallopsis blauda Cecalupo & Perugia, 2012

Type locality: Pamilacan Is., Philippines.

French Polynesia: Society Is. - Bora Bora, in sediment of the extreme point of the reef barrier, 2 spms [But];
Marquesas Is. - Nuku Hiva, sediment, 1 spm, 10 m, 1980 [Trn].

Marshallopsis boucheti Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Passe de Papeete, reef sediment, 1 spm, 06/1980 [Trn].

Marshallopsis gattellii Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Papeete, Motu Uta, 2 m [Ltn]; Tahiti, Arue, outer slope, 15-60 m [Ltn]; Tahiti, Arue, outer slope, 22 spms, 20-57 m [Ltn]; Tahiti, Mahina, Pointe Vénus, Banc du Dauphin, 1 spm, 18 m [Ltn]; Tahiti, Mahina, Baie de Matavai, 18/20 m [Ltn]; Tahiti, Tiarei, fringing reef, 1 m [Ltn]; Tahiti Mahaena, [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn]; Tuamotu Is. - Rangiroa, near Passe de Tiputa, 7 spm, 100 m [Ltn].

Marshallopsis granosa Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Marshallopsis limpida Cecalupo & Perugia, 2012

Type locality: Balicasag Is., Philippines.

French Polynesia: Society Is. - Bora Bora, in sediment of the extreme point of the reef barrier, 2 spms [But].

Marshallopsis lutea Cecalupo & Perugia, 2012

Type locality: Pamilacan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Punaauia, blocks on the reef, 1 spm, 02/1982 [Trn]; Tahiti, Papara, ringing reef, 1 spm, 50 m, 06/1982 [Trn]; Tahiti, Papara, reef brushing, 2 spms, 0.50 m 30/11/1989 [Trn]; Tahiti, Arue, 1 spm, 30 m [Ltn]; Tahiti, Mahina, Orofara, sediment on the beach, 3 spms [But]; Tahiti, Tiarei, sediment, 1 spm, 1 m, [Ltn]; Bora Bora, in sediment of the extreme point of the reef barrier, 1 spm [But]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn]; Marquesas Is. - Ua Pou, Haakuti, 2 spms, 70 m [Ltn].

Marshallopsis maesta Cecalupo & Perugia, 2012

Type locality: Balicasag Is., Philippines.

French Polynesia: Marquesas Is. - Ua Pou, Haakuti, 1 spm, 68 m [Ltn].

Marshallopsis melanesiana Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Tahiti, Passe de Papeete, reef sediment, 39 spms, 01/1981 [Trn]; Tahiti, Arue, 3 spms, 27 m [Ltn]; Tahiti, Arue, reef, Mission Poli Transect, 6 spms, 17/04/1982 [Trn]; Tahiti, Arue, sediment on Lafayette reef, 1 spm, 1985 [Trn]; Tahiti, Mahina, Pointe Vénus, Banc du Dauphin, 18m, [Ltn]; Tahiti, Mahina, blocks on the reef, 1 spm, 02/1982 [Trn]; Tahiti, Mahina, Pointe Vénus, brushing on coral blocks, 1 spm, 11/1989, [Trn]; Tahiti, Mahina, Orofora, beach sediment, 1 spm, 01/2009 [Trn]; Tahiti, Mahaiatea, blocks on the reef, 35 spms, 14/07/81 [Trn]; Tahiti, Afaahiti, sediment, 52 spms, 30/60m 06/1985 [Trn]; Tahiti, Faaone, Tahiti, brushing on coastal reef, 13 spms, 23/05/85 [Trn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn]; Tuamotu Is. - Anaa, sediment on the externe beach, 5 spms, 1980-81 [Trn]; stn TH02-03, Hereheretue, 4 spms, 60 m, 19°52,48'S, 145°00,40'w, 28/04/2011, Meru 34; Moruroa Atoll, 6 spms [But]; Rangiroa, Passe de Tiputa, 25 spm, 81/100 m, [Ltn]; Makemo, Passe d'Arikitamiro, 6 spms, 45 m [Ltn]; Makemo, sediment on reef front, 1 m [Ltn]; Anaa, sediment on extern beach, 36 spms, 1980-81 [Trn]; Moruroa, sediment on esterne beach, 14 spms, 1980 [Trn]; Austral Is. - Rurutu, sandy sediment on ringing reef, 51 m [Ltn]; Raivavae, sandy sediment on the lagoon, 2 spms [Ltn]; Banc du Président Thiers, N/O "Alis" campagne BENTHAUS, stn DW1927, 3 spms, 105-95 m, 24°39'S, 146°01,6'W, 13/11/2002.

Marshallopsis tutubaensis Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Tuamotu Is. - Tikehau, in sediment of the extreme point of the reef barrier, 1 spm [But].

Mendax cf. *marginata* Suter, 1908

Type locality: Three Kings Is., New Zealand.

French Polynesia: Society Is. - Tahiti, Arue, outer slope, 6 spms, 35 m [Ltn]; Tahiti, Mahina, Baie de Matavai, 16 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Mendax rufulus Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Bora Bora, on sediment on the outer slope of reef, 2 spm [But]; Tuamotu Is. - Moruroa, sediment on the externe beach, 2 spms, 1980 [Trn].

Ondulopsis annae Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. -Tahiti, 1 spm, 20 m [Ltn]; Tahiti, Punaauia, outer slope, 1 spm, 30 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn]; Austral Is. - Rapa, Baie de Ahurei [Ltn]; Rurutu, sandy sediment on fringing reef, 1 spm [Ltn];

Ondulopsis intricata Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Marquesas Is. - Ua Pou, Haakuti, 68m, 4 spms [Ltn].

Seila vanuatensis Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Tuamotu Is. - Anaa, sediment on the externe beach, 1 spm, 07/1980 [Trn].

Synthopsis albachiarae Cecalupo & Perugia, 2012

Type locality: Bohol Is., Philippines.

French Polynesia: Society Is. - Tahiti, Papeete, Motu Uta, 2 m [Ltn]; Tahiti, Arue, outer slope, 15-60 m [Ltn]; Tahiti, Mahina, Baie de Matavai, 18 m [Ltn]; Tahiti, Mahaena [Ltn]; Tahiti, Tiarei, fringing reef, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Synthopsis bongiardinoi Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Taravao, Baie de Port Phaeton, sediment on the beach, 2 spms [But]; Tahiti, Mahina, Pointe Vénus point, brushing on coral blocks, 1 spm, 11/1989 [Trn].

Synthopsis cebuensis Cecalupo & Perugia, 2012

Type locality: Cebu Is., Moalboal, Philippines.

French Polynesia: Society Is. - Tahiti [Ltn]; Motu One, sandy sediment, 2 spms, 1 m, bord récif [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Synthopsis nominii Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Synthopsis panglaoensis Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Synthopsis prima Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Mahina, coral blocks on the reef, 2 spms, 16/05/82 [Trn].

Synthopsis praeacuta Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Papeete, reef sediment, 2 spms, 06/1980 [Trn]; Tahiti, Punaauia, outer slope, 20 m [Ltn]; Tahiti, Arue, outer slope, 15-20 m [Ltn]; Tahiti, Baie de Arue 10-18 m [Ltn]; Tahiti, Mahina, Pointe Vénus, brushing on coral blocks, 1 spm, 11/1989 [Trn]; Tahiti, Tiarei, sediment, 1 spm, 1 m [Ltn]; Tahiti, Mahaena, fringing reef, 1 m [Ltn]; Tahiti, Mahaiatea, blocks on the reef, 2 spms, 14/07/81 [Trn]; Tahiti, Faaone, brushing on the coastal reef, 4 spms, 23/05/85 [Trn]; Tahiti, Afaahiti, sediment, 3 spms, 60 m, 06/1985 [Trn]; Tahiti, Afaahiti, sediment, 7 spms, 30 m, 06/1985 [Trn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn]; Marquesas Is. - Ua Pou, Hakahetau, 5m [Ltn]; Ua Pou, Haakuti 68 m, 4 spms [Ltn].

Synthopsis silviae Cecalupo & Perugia, 2012

Type locality: Panglao Is., Philippines.

French Polynesia: Society Is. - Tahiti, Afaahiti, sediment, 1 spm, 60m, 06/1985 [Trn].

Specula albengai Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Austral Is. - Raps, Baie Hiri, 1 spm, 5 m [Ltn].

Specula dubia Cecalupo & Perugia, 2013

Type locality: Espiritu Santo Is., Vanuatu.

French Polynesia: Society Is. - Tahiti [Ltn]; Bora Bora, reef, 2 spms, 1 m [Ltn]; Moorea [Ltn]; Tetiaroa, sandy sediment [Ltn]; Mehetia [Ltn].

Specula moalboalensis Cecalupo & Perugia, 2012

Type locality: Cebu Is., Moalboal, Philippines.

French Polynesia: Society Is. - Tahiti, Papeete, Motu Uta, 2 m [Ltn]; Tahiti, Arue, outer slope, 15-60 m [Ltn]; Tahiti, Mahina, Baie de Matavai, 18 m [Ltn]; Tahiti, Mahaena, [Ltn]; Tahiti, Tiarei, fringing reef, 1m [Ltn]; Tahiti, Mahina, Pointe Vénus brushing on coral blocks, 4 spms, 0.50 m, 15/11/89 [Trn]; Tahiti, Afaahiti, sediment, 5 spms, 30m, 06/1985 [Trn]; Tahiti, Afaahiti, sediment, 3 spms, 60 m, 06/1985 [Trn]; Moorea [Ltn]; Tetiaroa [Ltn]; Mehetia [Ltn].

Tubercliopsis miranda Cecalupo & Perugia, 2012

Type locality: Pamilacan Is., Philippines.

French Polynesia: Society Is. - Tahiti, Afaahiti, sediment, 1 spm, 60m, 06/1985 [Trn].

ACKNOWLEDGEMENTS

We would like to thank the malacological staff of the Museum national d'Histoire naturelle of Paris, Philippe Bouchet, Virginie Héros and Philippe Maestrati, for the availability of their material and the scientific and bibliographic support; Michel Boutet (Tahiti), Jean Letourneux (Tahiti) and Jean Tröndlé (France), who have put their collections avaible to us. We are also very grateful to the Museo di Storia Naturale di Milano, particularly to Michele Zilioli, for the SEM photos and to Elio Robba (UBM of Milano) for his constant suggestions. Thanks also to Jean Tröndlé, La Force, France, for his useful comments on the manuscript.

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Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
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NOVAPEX/SOCIETE

(suite)

C. Delongueville & R. Scaillet *avec* **M. Alexandre**	L'écho des réunions : - Roland Scaillet et Christiane Delongueville : Récoltes malacologiques en République turque de Chypre du Nord (14/12/2013)	7
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NOVAPEX
/ Société

Prochaines activités de la SBM

Claude VILVENS

Lieu de réunion : **A partir de 14h, à notre local habituel :**

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

SAMEDI 10 MAI 2014

Claude Vilvens : La détermination des escargots terrestres de Wallonie-Bruxelles

Que les naturalistes peu au fait de la malacologie éprouvent des difficultés à déterminer les escargots qu'ils rencontrent, spécialisés qu'ils sont en oiseaux, fleurs, champignons ou insectes, on peut le comprendre. Mais il n'est pas rare non plus de rencontrer des malacologues confirmés peu à l'aise dans ce genre d'exercice, simplement parce que leurs centres d'intérêt et de compétences se situent dans le monde des mollusques marins. Et on peut bien les comprendre puisque le président actuel de la SBM s'est d'abord spécialisé dans les Troques ;-) (donc des Marins), pour ensuite se dire qu'il n'était pas très normal de tout ignorer (ou presque) des mollusques terrestres de Belgique et d'Europe. Cela fait maintenant 20 and qu'il parcourt la campagne à leur recherche, seul ou avec les quelques autres membres de la SBM qui sont eux aussi des passionnés des "escargots". C'est une synthèse de ces observations et de cette expérience acquise qui est proposée ici à tous ceux qui ont envie d'en savoir plus sur les Clausilies, Moines, Maillots, Bulimes, Ambrettes, Hélices : bref sur nos "Escargots" !

***

SAMEDI 24 MAI 2014

Tout le monde : L'excursion de printemps de la SBM.

Avec le beau temps revient l'envie d'aller sur le terrain ;-) (air connu !). Nous envisageons de prospecter dans la région de Jette, dans quelques zones à haute valeur de biodiversité locale. Cette balade malaco sera aussi l'occasion de tester sur le terrain les connaissances acquises lors de la conférence du 10 mai.
Durée de l'excursion : la matinée (rendez-vous à 9h30 - fin vers 12h30).
Comme d'habitude, les dernières informations seront disponibles sur notre site Internet (http://www.societe-belge-de-malacologie.be/) ou auprès de Claude (vilvens.claude@skynet.be) et d'Etienne Meuleman (e.meuleman@skynet.be).
Comme d'habitude aussi, il convient de prévoir d'emporter sa bonne humeur, un guide de détermination … et sans doute aussi bottes et vêtements de pluie (en principe, il fera doux et ensoleillé, mais bon ;-) …).

***

SAMEDI 14 JUIN 2014

Tout le monde : Le quiz : le grand jeu des coquillages

Avant les grandes vacances, nous vous proposons à nouveau de nous retrouver pour une activité ludique puisque nous allons en effet à nouveau jouer – vous l'aurez compris, il s'agira du quiz malacologique, formule qui a remporté beaucoup de succès lors de ses précédentes éditions, au point d'ne devenir une tradition pour fêter le début de l'été. Et on gagnera encore une fois quelque chose : mais oui, des coquilles bien sûr ☺ Un joyeux après-midi avant les grandes vacances !

***

Réservez** déjà dans vos agendas le **6/9/2014 et le ***27/9/2014*** (excursion).

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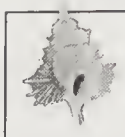
Pour les informations de dernière minute :



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Novapex/Société : la publication généraliste de la SBM

Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

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- document MS-Word (pour PC Windows);
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- interligne simple;
- toutes les marges à 2,5 cm;
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- pas de mode colonne;
- photos en version électronique JPG ou PNG.

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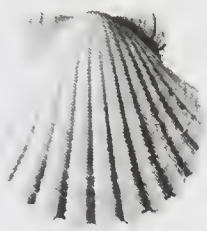

Inventaire des mollusques présents dans le tube digestif d'un *Spatangus purpureus* O.F. Müller, 1776 à Favignana (Iles Egades - Sicile - Italie)

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MOTS-CLEFS Echinoidea - *Spatangus purpureus* - Contenu digestif - Mollusques

KEY-WORDS Echinoidea - *Spatangus purpureus* - Digestive content - Molluscs

RÉSUMÉ

Le contenu du tube digestif d'un oursin irrégulier, *Spatangus purpureus*, pêché au large de la Sicile, dans les Iles Egades, a été prélevé pour analyse. Celle-ci s'est limitée à l'inventaire des mollusques présents dans le sédiment ingéré par l'échinoderme et a révélé la présence de 23 espèces de gastéropodes, 21 espèces de bivalves et 1 espèce de polyplacophores pour un total de plus de 80 individus.

ABSTRACT

The gut content of an irregular sea urchin *Spatangus purpureus*, collected off the Egadi Islands in Sicily was taken for analysis. This was limited to an inventory of the molluscs present in the sediment ingested by the echinoderm. The analysis showed the presence of 23 species of gastropods, 21 species of bivalves and 1 species of polyplacophoran for a total of more than 80 individuals.

INTRODUCTION

Spatangus purpureus O.F. Müller, 1776 (Echinodermata - Spatangidae - Fig. 1) est un oursin irrégulier d'une douzaine de centimètres à symétrie bilatérale secondaire dont la bouche se situe sur la partie avant de sa face ventrale qui est plate et dont l'anus débouche sur l'arrière de sa face dorsale qui est bombée. Il est couvert de nombreux piquants, petits, fins et soyeux et de plus rares piquants allongés et plus solides implantés de façon régulière et symétrique sur sa face dorsale. Il est de couleur pourpre, ce qui est à l'origine de son nom. On le trouve dans l'Atlantique Nord-Est, de la Norvège au nord de l'Afrique ainsi qu'en Méditerranée (Hayward & Ryland 1998). Il vit sur des fonds sablo-graveleux ou détritiques depuis une faible profondeur jusqu'à généralement 70 à 80 mètres et même jusqu'à 900 mètres (Gage 1965). Il s'enfonce dans le sable et évolue à moitié enfoui lorsqu'il se nourrit en labourant le fond. Il participe ainsi au mélange et à la migration des sédiments du fond marin vers des zones plus profondes du sol, permettant ainsi à de petits métazoaires benthiques (méiofaune) de se nourrir. On le qualifie de détritivore car il se nourrit de matières organiques extraites des sédiments qu'il ingère. Barberá et al. (2011) ont récemment étudié l'origine de la nourriture de *Spantangus purpureus* dans la région des Iles Baléares (Espagne). Sur base du type d'acides gras isolés dans les gonades, ces auteurs ont démontré que ces oursins sont omnivores et se nourrissent de débris d'algues lorsque leur milieu en est pourvu ou de résidus animaux et bactériens lorsque leur milieu est pauvre ou dépourvu en algues. Biagi (1975) s'est intéressé au contenu intestinal de *Spatangus purpureus* et *Brissus unicolor* (Leske, 1778) (un autre oursin irrégulier fréquent en Méditerranée) dragués par 50 à 70 mètres de profondeur dans l'Archipel Toscan. En pratiquant une ouverture dans la face dorsale de l'oursin l'auteur a observé le tube digestif contenant les sédiments ingérés par l'animal. Cet organe occupe la quasi totalité de la cavité. Un spécimen de *Spatangus purpureus* de taille moyenne (9 x 8 cm) peut contenir jusqu'à 90 g de sédiments en poids sec. Ces sédiments sont composés d'un mélange de sable, de débris d'algues coralligènes, de foraminifères, de fragments de test de crustacés ou d'autres oursins et de mollusques. Pour ces derniers, il s'agit généralement de fragments de coquilles (gastéropodes et scaphopodes), de valves dépareillées de bivalves et de plaques isolées de polyplacophores. Il est courant de rencontrer des gastéropodes juvéniles entiers et même des petits bivalves encore pourvus de parties molles, ceux-ci ayant été pris vivants lors de l'ingestion des sédiments par l'oursin. Une liste de 53 gastéropodes, 36 bivalves et 3 scaphopodes a été établie sur l'ensemble des spécimens disséqués.

Cet oursin est souvent accompagné de *Montacuta substriata* (Montagu, 1808) (Montacutidae - Fig. 4), petit bivalve inéquilatéral de forme ovale, dont l'umbo est placé dans la partie postérieure de la coquille. Sa taille ne dépasse généralement guère 4 mm. Il est caractérisé par la présence de stries radiaires sur chacune de ses valves. Il s'attache préférentiellement (Fig. 3) par un byssus à l'un ou l'autre piquant de la partie arrière ou ventrale du spatangue (Delongueville & Scaillet 2004).

RÉCOLTES PERSONNELLES

Du matériel provenant d'un fond détritique (à 80 mètres de profondeur) a été collecté par une barque de pêche à Favignana (Iles Egades - Sicile) au mois de juin 2013 (Carte 1).

Dans le sédiment, les échinodermes étaient présents en très grand nombre : holothuries, ophiures [*Astrospartus mediterraneus* (Risso, 1826)], astéries [*Astropecten aranciacus* (Linnaeus, 1758), *Hacelia attenuata* Gray, 1840)] et oursins [*Cidaris cidaris* (Linnaeus, 1758), *Spatangus purpureus* O.F. Müller, 1776)]. Ceci explique la présence dans le matériel collecté de nombreuses espèces d'Eulimidae (gastéropodes parasites d'échinodermes), parmi celles-ci *Sabinella piriformis* Brugnone 1873, *Nanobalcis nana* (Monterosato, 1878), *Parvioris ibizencus* (Norsieck, 1968), *Melanella frielei* (Jordan, 1895), *Sticteulima jeffreysiana* (Brusina, 1869) et bien d'autres encore. Des spécimens vivants de *Montacuta substriata* (bivalves - Montacutidae) faisaient aussi partie de l'échantillon. Malheureusement, ni ce bivalve, ni les Eulimidae n'ont été trouvés fixés à leur hôte. Un spécimen de *Spatangus purpureus* non brisé de 10,0 x 9,0 cm a été isolé pour inventorier le contenu de son tube digestif. Une fois séché, l'oursin a été vidé et son contenu examiné à la loupe binoculaire. Il s'agissait essentiellement de fragments détritiques pouvant mesurer jusqu'à 7 mm de long, parmi lesquels étaient présentes 23 espèces de gastéropodes, 21 espèces de bivalves et 1 espèce de polyplacophores pour un total de plus de 80 individus (Tableaux 1, 2 et 3).

Tableau 1	**Gastropoda**	**n**
Anatomidae	*Anatoma micalii* Geiger, 2012	1
Caecidae	*Caecum subannulatum* de Folin, 1870	2
	Caecum trachea (Montagu, 1803)	2
Cerithiidae	*Bittium lacteum* (Philippi, 1836)	3 fragments
	Bittium submamillatum (de Rayneval & Ponzi, 1854)	2
Creseidae	*Creseis acicula* Rang, 1828	1
Epitoniidae	*Epitonium clathrus* (Linnaeus, 1758)	1
Eulimidae	*Eulimidae sp.*	1
	Melanella frielei (Jordan, 1895)	2
Lottiidae	*Tectura virginea* (O.F. Müller, 1776)	2
Murchisonellidae	*Ebala nitidissima* (Montagu, 1803)	1
Raphitomidae	*Raphitoma echinata* (Brocchi, 1814)	1 fragment
	Raphitoma sp.	1 fragment
Rissoidae	*Obtusella intersecta* (S. Wood, 1857)	2
	Pusillina inconspicua (Alder, 1844)	1
	Pusillina sp.	1
Scissurellidae	*Scissurella costata* d'Orbigny, 1824	2
Triphoridae	*Metaxia metaxa* (Delle Chiaje, 1828)	1
	Monophorus thiriotae Bouchet, 1985	1 fragment
Trochidae	*Jujubinus tumidulus* (Aradas, 1846)	2
Turbinidae	*Bolma rugosa* (Linnaeus, 1767)	2
Turritellidae	*Turritella communis* Risso, 1826	1 fragment 4,5 mm
Vanikoridae	*Megalomphalus azoneus* (Brusina, 1865)	1

Tableau 2	Bivalvia	n
Arcidae	*Bathyarca pectunculoides* (Scacchi, 1835)	1 valve
Astartidae	*Astarte sp.* juvénile	1 double
	Digitaria digitaria (Linnaeus, 1758)	3 valves
	Goodallia triangularis (Montagu, 1803)	1 double
Carditidae	*Centrocardita aculeata* (Poli, 1795)	1 valve
	Coripia corbis (Philippi, 1836)	2 doubles
Kelliidae	*Kellia suborbicularis* (Montagu, 1803)	2 valves
Limidae	*Limatula gwyni* (Sykes, 1903)	2 valves
	Limatula subovata (Monterosato, 1875)	1 valve
Leptonidae	*Hemilepton nitidum* (Turton, 1822)	1 valve
Montacutidae	*Mancikellia parrussetensis* (Giribet & Peñas, 1999)	2 valves
Myidae	*Sphenia binghami* Turton, 1822	1 valve
Mytilidae	*Gregariella semigranata* (Reeve, 1858)	1 valve
	Modiolula phaseolina (Philippi, 1844)	1 valve
Neoleptonidae	*Neolepton sulcatulum* (Jeffreys, 1859)	8 valves
Nuculidae	*Nucula nitidosa* Winckworth, 1930	3 valves - 7 mm
Propeamussiidae	*Parvamussium fenestratum* (Forbes, 1844)	1 valve
	Similipecten similis (Laskey, 1811)	+ de 10 valves
Psammobiidae	*Gari costulata* (Turton, 1822)	1 valve
Semelidae	*Abra alba* (W. Wood, 1802)	1 valve
Veneridae	*Timoclea ovata* (Pennant, 1777)	2 doubles

Tableau 3	Polyplacophora	n
Callochitonidae	*Callochiton septemvalvis* (Montagu, 1803)	8 plaques

DISCUSSION

Cet inventaire ne donne qu'une idée partielle de la composition de la faune malacologique présente sur ce fond détritique.

Les mollusques présents dans le contenu intestinal de l'oursin ne font pas l'objet de sa part d'une collecte sélective. En se déplaçant, il ingère tout simplement du sédiment dans lequel le hasard fera que se trouvent ou non des mollusques morts ou même vivants. La taille de ceux-ci est limitée par celle de l'ouverture de la bouche qui n'est pas extensible, puisque le test de l'oursin est rigide. L'ouverture buccale du *Spatangus purpureus* de Favignana est de 15,0 x 7,0 mm (Fig. 3). L'oursin ne peut donc avaler que des éléments dont la taille est inférieure à celle de l'ouverture buccale. Cela laisse néanmoins la place pour l'ingestion de particules détritiques de tailles relativement grandes, certaines valves de *Nucula nitidosa* présentes dans l'animal étudié mesuraient jusqu'à 7 mm. Il n'est donc pas étonnant que les espèces de mollusques dont les adultes sont naturellement de petite taille puissent être ingérées sans problème (*Caecum*, *Scissurella*, *Obtusella*, *Ebala*, *Pusillina*, *Hemilepton*, *Neolepton*...) et même vivants (*Caecum subannulatum* avec son opercule, *Goodallia triangularis* et *Coripia corbis* encore avec parties molles). Pour les espèces dont les adultes atteignent une plus grande taille, leur présence sera limitée à l'ingestion de spécimens juvéniles uniquement (*Bolma*, *Epitonium*, *Jujubinus*, *Turritella*, *Gari*, *Abra*, *Timoclea*...), certains aussi pouvant être vivants (*Timoclea ovata* avec parties molles).

Ceci différencie le mode alimentaire passif de *Spatangus purpureus* du mode alimentaire actif de l'étoile de mer *Astropecten aranciacus*. Pour sa part, elle agit comme un prédateur qui effectue des collectes sélectives. Les mollusques font partie intégrante de son régime alimentaire. Grâce à sa grande taille (envergure 40 cm, diamètre du disque 10 cm), à la possibilité d'évagination de son estomac et à la relative plasticité de son ouverture buccale elle est à même de capturer des mollusques relativement grands.

CONCLUSIONS

A l'instar de certaines étoiles de mer dont l'estomac peut contenir des mollusques, des oursins irréguliers peuvent également en contenir dans leur tube digestif. Pour les premières, les mollusques sont des proies et ils aboutissent dans l'estomac de l'échinoderme de façon active, car les animaux exercent une prédation volontaire. Pour les seconds, ils ne font pas partie de leur régime alimentaire, c'est le hasard qui décidera de leur présence dans le sédiment ingéré par les animaux pour trouver leur nourriture. Dans les étoiles de mer prédatrices de mollusques on peut trouver des coquilles de très grandes tailles, dans les oursins irréguliers, la taille des mollusques est fonction de la grandeur de l'ouverture de la bouche. Comme elle est étroite et rigide, l'oursin ne contiendra que des espèces de petites tailles ou des spécimens juvéniles.

Ces deux types d'échinodermes offrent une manière aisée de se procurer sur des bateaux de pêche des espèces de mollusques ou micro-mollusques benthiques.

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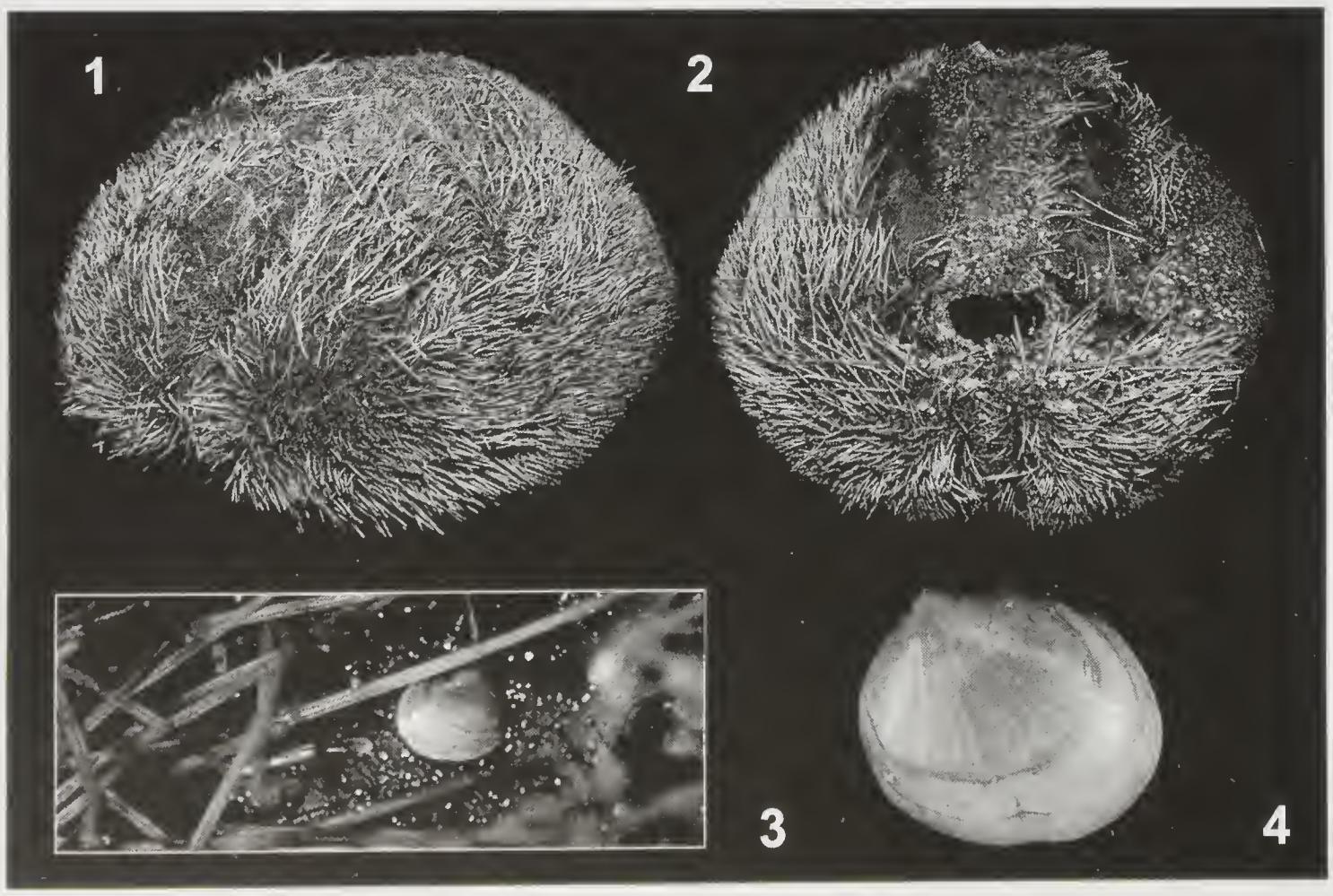
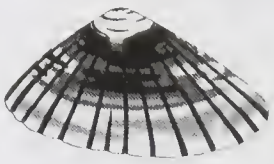
LÉGENDES

1. *Spatangus purpureus* - Favignana - Iles Egades (I) 10,0 x 9,0 cm. 2. *Spatangus purpureus* - Favignana - Iles Egades (I) - Ouverture buccale dégagée 15,0 x 7,0 mm. 3. *Montacuta substriata* sur *Spatangus purpureus* - Isola Rossa - Sardaigne (I). 4. *Montacuta substriata* - Isola Rossa - Sardaigne (I) 3,1 x 2,7 mm.





L'écho des réunions

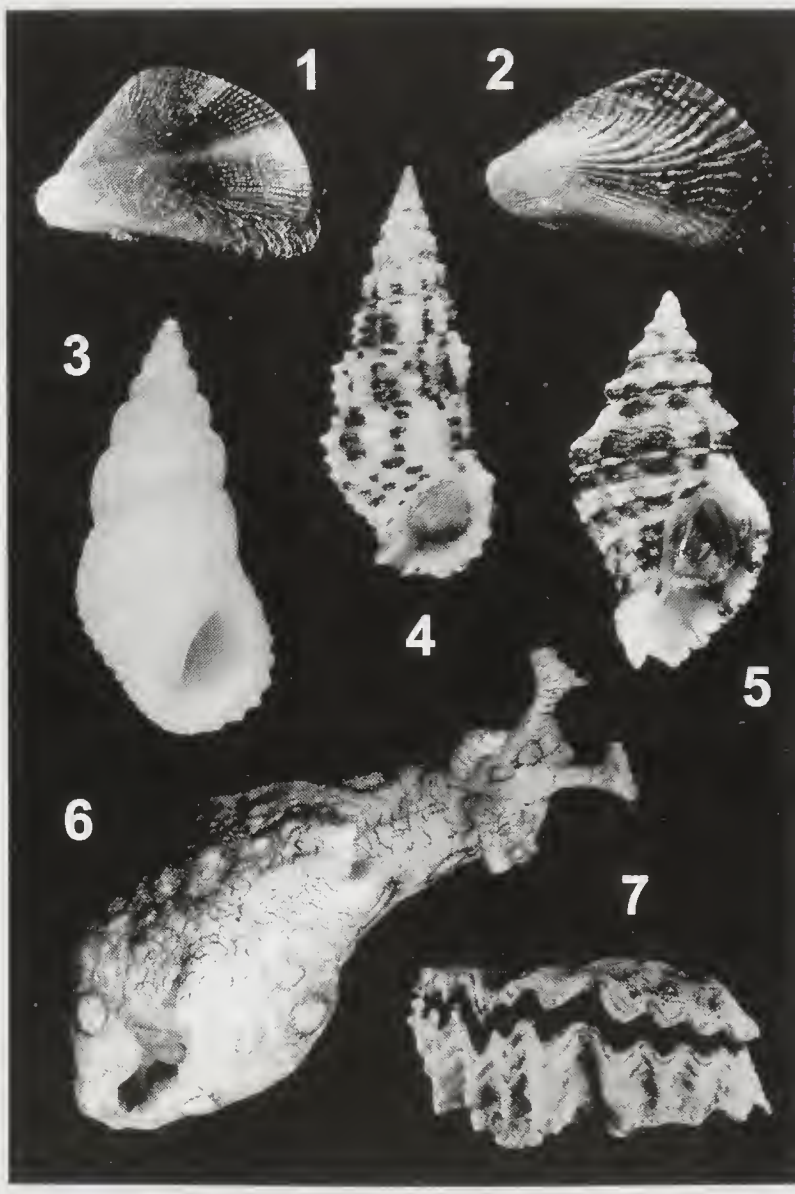
Christiane DELONGUEVILLE & Roland SCAILLET / Marc ALEXANDRE

Réunion du 14 décembre 2013 (MA et CV) → **Roland Scaillet et Christiane Delongueville : Récoltes malacologiques en République turque de Chypre du Nord**

C'est presque devenu une tradition au sein de notre société de terminer l'année en ayant le plaisir de donner la parole à nos deux globe-trotters passionnés de mollusques Européens. Ce rendez-vous attendu avec impatience par chacun d'entre nous est à chaque fois une superbe découverte que ce soit d'un point de vue géographie, historique, mais aussi et surtout malacologique. Mais trêve de balivernes laissons plutôt la parole à nos deux compagnons de voyage.

« La République turque de Chypre du Nord est située à l'est de la Méditerranée dans le bassin levantin. Des photos de monuments et de sites incontournables ont raconté l'histoire de l'île depuis le temps des Romains en passant par celui des Francs (les Lusignan), des Croisés, des Vénitiens et des Ottomans pour terminer avec l'Empire Britannique, l'indépendance de l'île et sa division actuelle en deux états autonomes.

Autour de l'île de Chypre, les courants marins de surface tournent dans le sens inverse des aiguilles d'une montre. La position de l'île dans le bassin levantin la place dans des eaux dont la salinité et la température sont plus élevées que celles relevées en moyenne dans les autres parties de la Méditerranée. Tous ces paramètres (courants, température et salinité) contribuent à en faire un endroit propice à l'installation d'espèces invasives, qu'elles soient d'origine lessepsienne ou dues au développement de la navigation en provenance de régions tropicales. Le nord de l'île est situé à quelques 70 km de la côte turque, à l'est, la Syrie est éloignée de plus de 100 km. L'éloignement relatif de l'île de Chypre des côtes libanaises et israéliennes peut contribuer à expliquer le nombre relativement faible d'espèces invasives répertoriées autour de l'île en comparaison de ces pays.



L'iconographie malacologique qui a été présentée était le fruit de trois voyages dans ce pays aux plages idylliques et désertes fréquentées par deux espèces de tortues marines qui viennent y pondre leurs œufs en toute tranquillité. Pour les mollusques, ont été illustrées des espèces pélagiques (*Janthina janthina* et *Janthina prolongata*), des espèces parasites d'oursins (*Vitreolina philippi*), des espèces classiques (*Typhinellus labiatus* collecté dans l'estomac d'une astérie, *Astropecten aranciacus*), des espèces de la Méditerranée orientale (*Charonia variegata*, *Nassarius gibbosulus* ou encore *Nassarius circumcinctus*) et enfin des espèces invasives (parmi d'autres : *Septifer forskali*, *Acteocina mucronata*, *Cinguinla isseli*…). Parmi les techniques de récolte présentées, les plus productives ont été la collecte de laisse de mer, le nettoyage des filets de pêche et la plongée en apnée dans les eaux peu profondes. Au total, 18 espèces invasives de mollusques marins (bivalves et gastéropodes confondus) sur les 42 répertoriées en 2009 dans la littérature ont été illustrées par des spécimens photographiés in situ ».

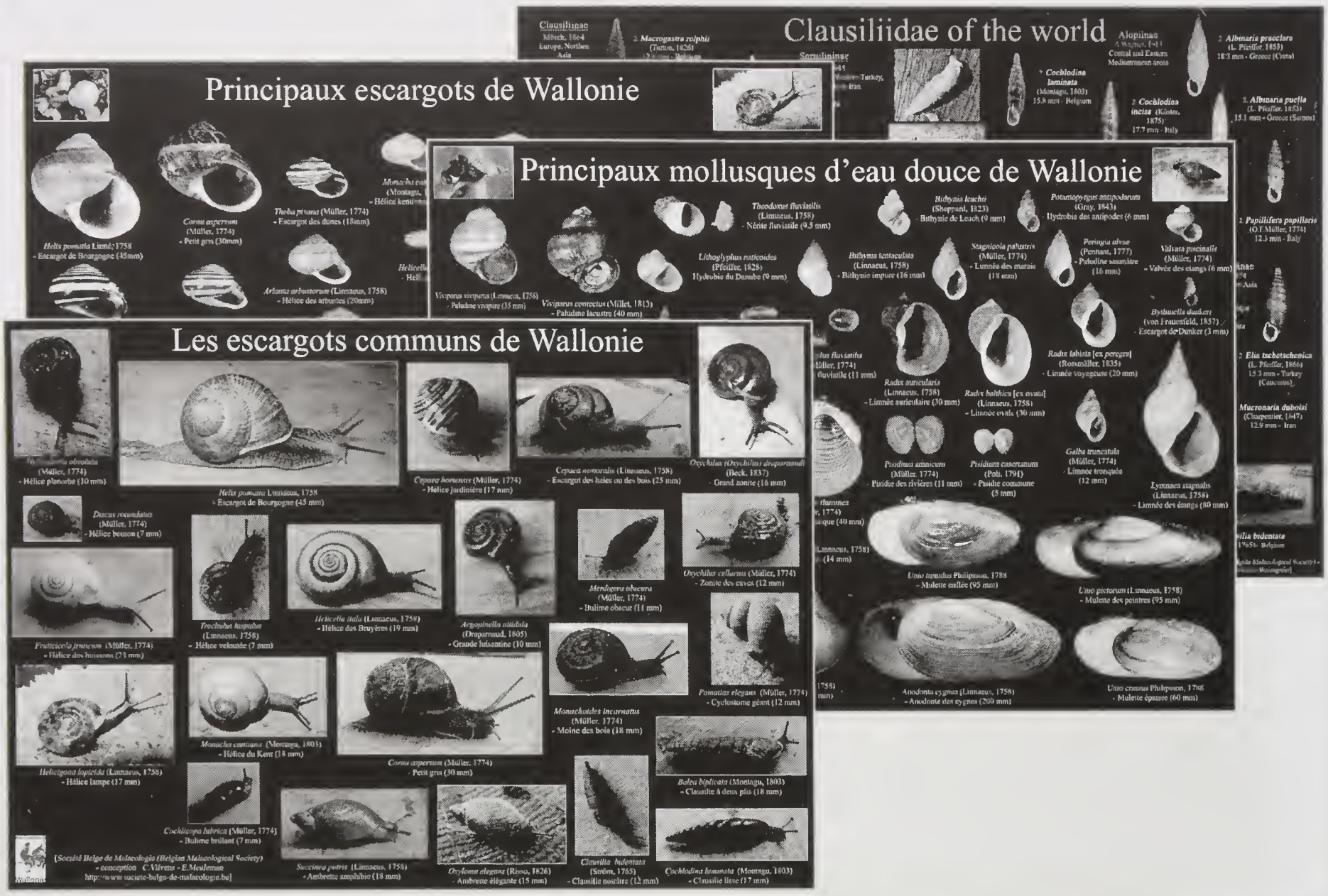
1. *Septifer forskali* 9,7 x 6,9 mm - 2. *Brachidontes pharaonis* 7,9 x 5,3 mm - 3. *Rissoina bertholleti* 5,2 x 2,3 mm 4. *Cerithium scabridum* 19,4 x 7,9 mm - 5. *Ergalatax junionae* 21,8 x 11,4 mm - 6. *Aplysia dactylomela* 200 mm 7. *Dendrostrea frons* 23.9 x 11,1 mm

Un grand merci à Roland et Christiane pour cet exposé riche en informations et en illustrations.

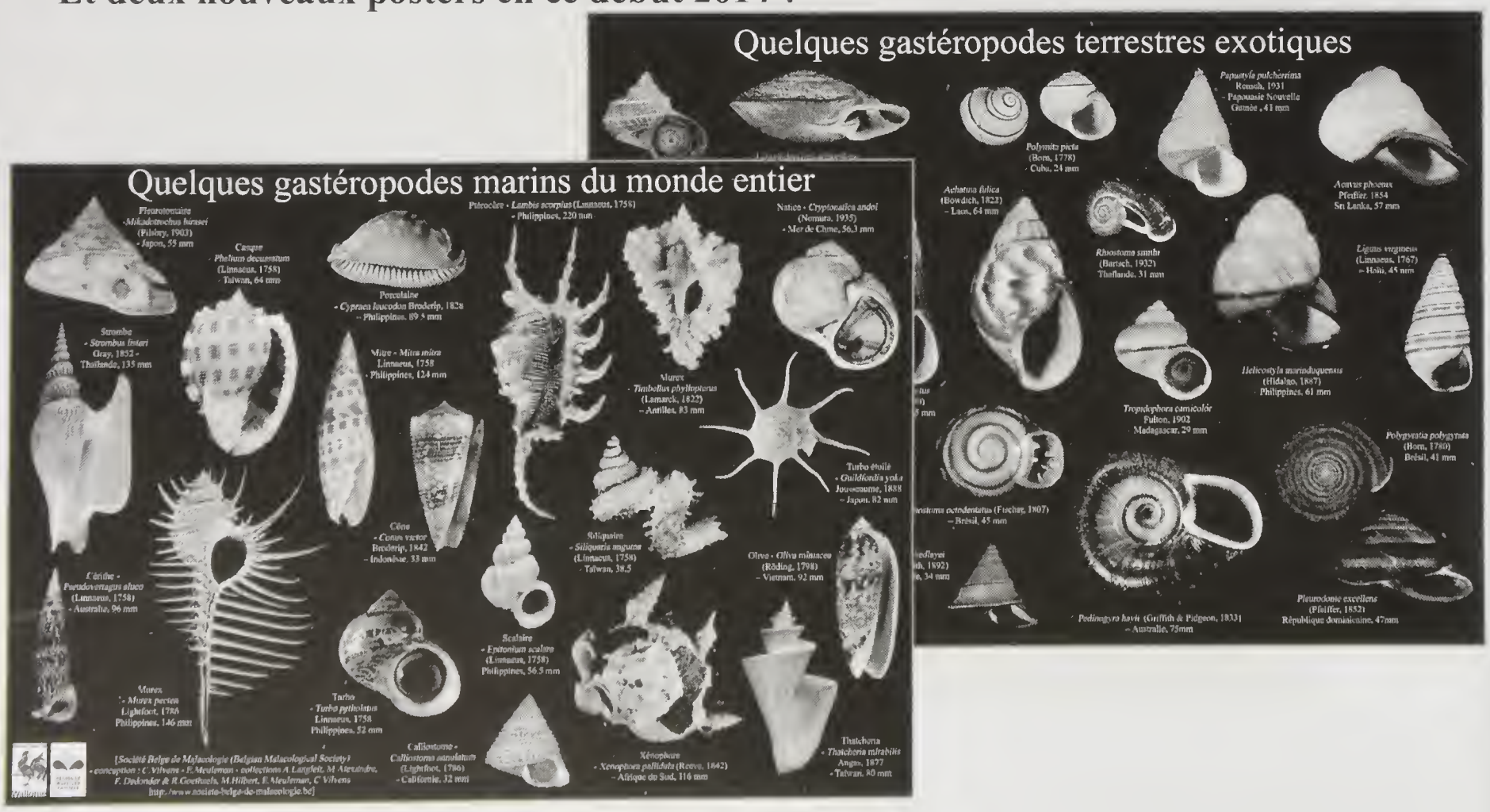
Du neuf du côté des publications de la SBM

<u>Les posters de la SBM déjà disponibles</u> : format A3, plastifiés – **5.00 EUR + port.**

Renseignements : Etienne Meuleman - **e.meuleman@skynet.be**



Et deux nouveaux posters en ce début 2014 :



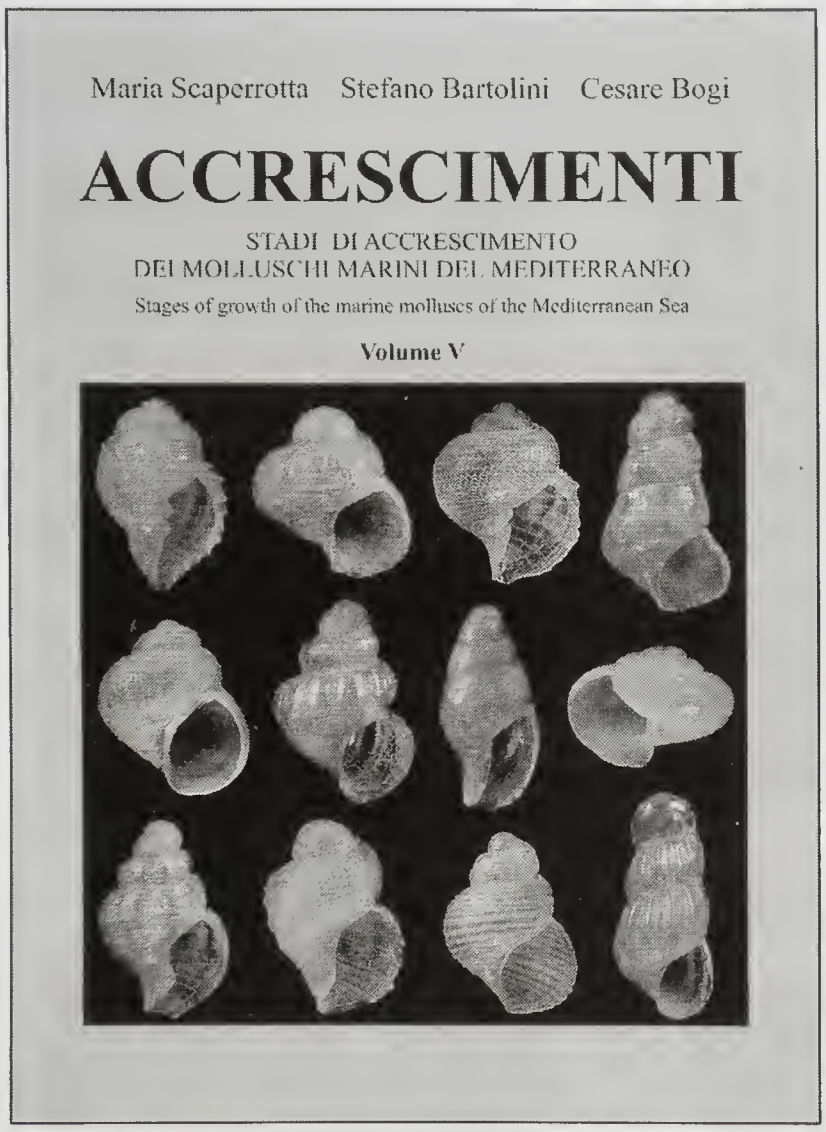
Quelques nouvelles publications

Roland SCAILLET & Claude VILVENS

Accrescimenti Tome V
Stadi di accrescimento dei molluschi marini del Mediterraneo

par **Maria Scaperrotta - Stefano Bartolini - Cesare Bogi**

192 pages **Editeur** : L'Informatore Piceno - Ancona - Italie – 2013	**Prix** : 65.00 EUR



Et bien oui, voilà que vient d'être publié le cinquième volume d'un Opus commencé en 2009 : « **Accrescimenti - Stadi di accrescimento dei molluschi marini del Mediterraneo** ». Les auteurs nous y annoncent déjà qu'ils travaillent à l'élaboration du sixième tome. Si nous l'attendons avec impatience, ne boudons pas notre plaisir et voyons d'abord ce que nous apporte le cru 2013.

126 espèces viennent s'ajouter à celles déjà illustrées. A ce jour, 632 espèces ont fait l'objet de ce concept unique: nous présenter pour chacune d'elles leurs différents stades de croissance. Cette entreprise n'est pas sans nous réserver des surprises, tant parfois et même souvent la forme des spécimens juvéniles diffère du tout au tout de celles des exemplaires adultes. Dans ce cinquième volume, on retiendra particulièrement l'illustration d'espèces invasives sur base de matériel en provenance des côtes d'Israël comme *Cerithidium diplax, Cerithidium perparvulum, Diodora ruppellii, Electroma vexillum, Monotygma watsoni, Murex forskoehli, Odostomia lorioli, Timoclea roemeriana*. Parmi les gastéropodes, une attention particulière a été consacrée à des éléments du zooplancton comme nombre de représentants de la famille des Atlantidae, des Cavoliniidae, des Cliidae et des Limacinidae. Les bivalves n'ont pas été oubliés, avec un effort tout particulier portant sur les familles des Limidae, Semelidae et Thraciidae. En fin de volume des planches rassemblant les espèces d'une même famille ont l'intérêt de souligner des différences qui bien souvent restent subtiles et difficiles à appréhender lorsqu'on ne dispose pas d'une vue d'ensemble des espèces.

Pour chaque taxon spécifique, la liste systématique des espèces illustrées à ce jour publiée en début d'ouvrage renvoie le lecteur au volume correspondant. Si l'Italien n'est pas votre langue maternelle, il n'y a aucun problème. La fiche technique se rapportant à chaque espèce est traduite en Anglais en fin de volume.

Digérons le volume V en tout premier lieu et attendons avec impatience ce que nous réservent **Maria Scaperrotta, Stefano Bartolini et Cesare Bogi** dans le sixième volume déjà en préparation.

Avis aux amateurs et bonne lecture.

Roland Scaillet

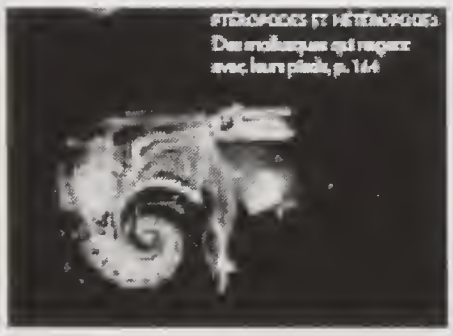
Plancton, aux origines du vivant

par **Christian Sardet**

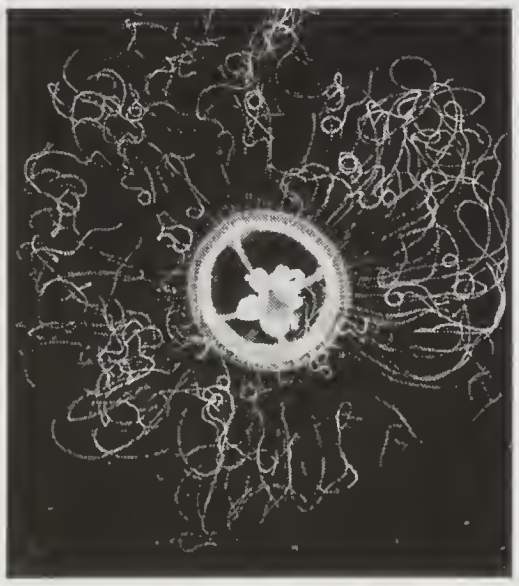
216 pages, 550 illustrations ISBN : 9782841386345 Année d'édition : 2013	Editions Ulmer : http://www.editions-ulmer.fr/livre/plancton-aux-origines-du-vivant-430-l.htm **Prix**: 39.90 EUR

Voici bien un livre magnifique !
D'abord par son iconographie, présentant les divers organismes du plancton dans leur milieu : les photos sont à couper le souffle, tant elles sont précises, lumineuses sur un fond sombre, parfois surprenantes, toujours d'une telle qualité que l'on peut parler de photo d'art.
Ensuite, par la richesse de l'information contenue : c'est à un véritable parcours exhaustif de toutes les composantes du plancton que le lecteur est invité.

Bien sûr, il y a notamment des mollusques, comme les céphalopodes, les nudibranches et surtout les ptéropodes et les hétéropodes :



Mais il y a aussi des crustacés en tous genres (ostracodes, copépodes, amphipodes …), des cnidaires (où, à côté des méduses classiques, on découvre que les coraux calcaires ne sont pas les seules communautés : les siphonophores en constituent une autre forme), des éponges, des être unicellulaires, très nombreux et aux formes étranges (foraminifères, coccolithophores, diatomées, radiolaires)



A remarquer encore la présence de QR codes insérés dans les différents chapitres du livre : ils permettent d'accéder avec un smartphone ou une tablette aux 20 vidéos des "Chroniques du Plancton" (www.planktonchroniques.org/fr).

Un cadeau splendide à offrir ou plutôt à s'offrir ;-) !

Claude Vilvens

Nous avons reçu

Etienne MEULEMAN

LES NATURALISTES DE LA HAUTE-LESSE

(Belgique)
N°274, novembre – décembre 2013

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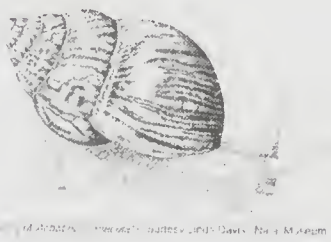

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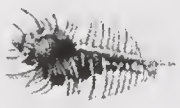

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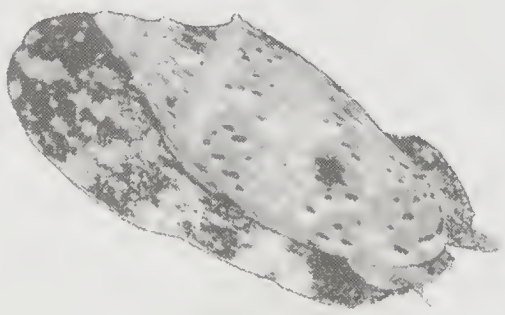

TRITON

Journal of the Israel Malacological Society

ISSN 1565-1916
Published twice a year since 2000
Yearly subscription rate 20 €

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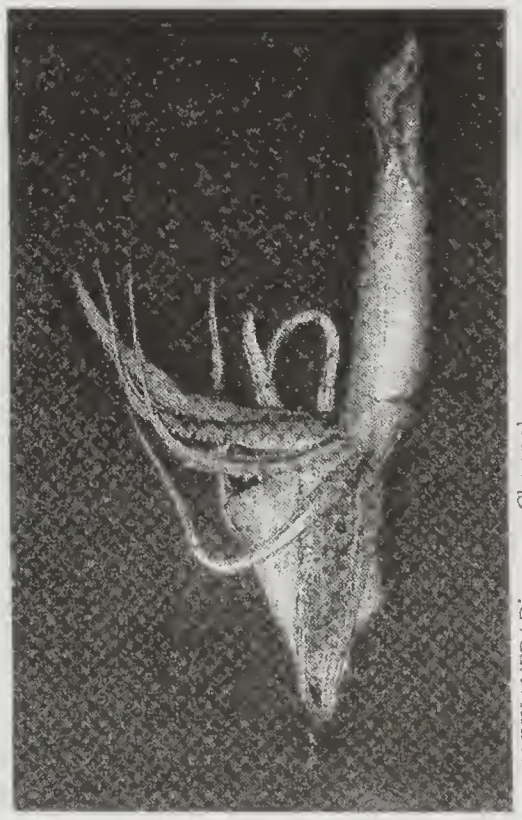
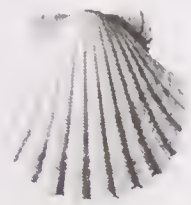
Calamar géant dans le Pacifique

TOKYO Des scientifiques et des chaînes de télévision japonaise et américaine ont annoncé hier avoir filmé pour la première fois un calamar géant par 900 m de fond dans l'océan Pacifique. L'animal mythique, de couleur argentée, a été filmé par une équipe du Musée scientifique national japonais en collaboration avec la chaîne de télévision publique japonaise NHK et la chaîne spécialisée Discovery Channel. Le calamar géant, dont le nom scientifique est architeuthis, a été repéré par 630 mètres de fond par une équipe en sous-marin dans le Pacifique nord. Le submersible a suivi le géant jusqu'à 900 m de profondeur avant qu'il ne disparaisse dans les abysses. Le seul corps du calamar a été évalué à 3 m de long. Sa longueur totale a été estimée à 8 m, en l'absence de ses deux principaux tentacules qui étaient sectionnés. ■



AFP / NHK / NFP / Discovery Channel



Grandes marées de l'année 2014

Christiane DELONGUEVILLE et Roland SCAILLET

- Enfin une bonne année avec des marées de 115 en mars et en septembre. En février, août et octobre, les marées présenteront également de beaux coefficients supérieurs à 110. Voilà de quoi nous réjouir !

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Mercredi 1	(96) - 100
	Jeudi 2	104 - 107
	Vendredi 3	108 - 108
	Samedi 4	106 - 103
	Jeudi 30	(95) - 101
	Vendredi 31	107 - 111

Février	Samedi 1	113 - 114
	Dimanche 2	113 - 110
	Lundi 3	106 - 101
	Vendredi 28	(95) - 102

Mars	Samedi 1	108 - 112
	Dimanche 2	114 - 115
	Lundi 3	114 - 112
	Mardi 4	108 - 102
	Dimanche 30	104 - 107
	Lundi 31	109 - 109

Avril	Mardi 1	108 - 106
	Mercredi 2	102 - (98)

Mai	-	-

Juin	Samedi 14	(98) - 100
	Dimanche 15	100 - 99

Juillet	Dimanche 13	101 - 105
	Lundi 14	106 - 107
	Mardi 15	106 - 104
	Mercredi 16	101- (96)

Août	Dimanche 10	(95) - 101
	Lundi 11	106 - 110
	Mardi 12	112 - 113
	Mercredi 13	112 - 110
	Jeudi 14	106 - 101

Septembre	Lundi 8	(97) - 104
	Mardi 9	109 - 113
	Mercredi 10	115 - 115
	Jeudi 11	114 - 111
	Vendredi 12	106 - 100

Octobre	Mardi 7	(96) - 102
	Mercredi 8	106 - 109
	Jeudi 9	111 - 111
	Vendredi 10	109 - 106
	Samedi 11	102 - (96)

Novembre	Jeudi 6	(98) - 100
	Vendredi 7	101 - 101
	Samedi 8	100 - (98)

Décembre	-	-

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REFERENCE :

Annuaire des Marées pour 2014 - Ports de France - Métropole - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Paris - 256 p.*

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Trimestriel de la Société Belge de Malacologie
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Quarterly of the Belgian Malacological Society

VOL. 15 (2) 2014 10 JUIN

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ISSN 1375-7474

Périodique trimestriel
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SOCIETE BELGE DE MALACOLOGIE

New Muricidae (Mollusca: Neogastropoda) from the Lower Miocene Cantaure Formation of Venezuela

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ABSTRACT. Seven new muricine records are added to that for the Lower Miocene Cantaure Formation of Venezuela, four of which are new: *Siratus harzhauseri* nov. sp. *Ocenebra etteri* nov. sp., *Typhina canaliculata* nov. sp. and *Laevityphis jungi* nov. sp., and three are identified to genus level *Phyllonotus* sp. cf. *P. infrequens* (Vokes, 1963), *Purpurellus* sp. cf. *P. repetiti* (Vokes, 1970) and *Vitularia* sp. cf. *V. salebrosa* (King & Broderip, 1832). The genus *Ocenebra* is recorded in the western Atlantic for the first time.

KEYWORDS. Muricidae, Mollusca, Miocene, Cantaure Formation, Venezuela, new records, new taxa.

INTRODUCTION

In his landmark monograph on the molluscan assemblage of the Cantaure Formation, Jung (1965) recorded and described ten muricine species from the deposits. Further new species were added in the 1990's by Vokes (1992, 1994, 1995), Vermeij & Vokes (1997), and later by Vermeij (2001) and Landau & Vermeij (2010). A full list of all species described or recorded from the Cantaure Formation subsequent to Jung's (1965) monograph were listed by Landau & Vermeij (2010, p. 105, appendix 1).
A short account of the geographical and stratigraphical range was given by Landau & Vermeij (2010, p. 99). This will not be repeated here, except to say that the assemblage is now considered to be late early Miocene in age (Landau *et al.*, 2012, p. 258, chart 18).
In this contribution to the knowledge of the gastropod assemblage found in the late early Cantaure Formation of Venezuela, we focus on new species, or taxa not previously recorded from the assemblage. This increases the number of muricine species known from the formation to 29.

Material and methods

The material described here is from the Gibson-Smith collection housed in the Naturhistorisches Museum Basel (NHMB coll.), Switzerland and the Bernard Landau collection (BL coll.), now deposited in the Naturhistorisches Museum Wien (NHMW coll.), Vienna.
The classification adopted here is according to WoRMS (http://www.marinespecies.org/index.php). The descriptions adopt the terminology suggested by Merle (1999, 2001) (Figs 1, 8), see next page:

P	Primary cord
s	secondary cord
t	tertiary cord
Ad	adapical (or adapertural)
Ab	abapical (or abapertural)
SP	Subsutural cord
IP	Infrasutural primary cord (primary cord on shoulder)
adis	adapical infrasutural secondary cord (shoulder)
abis	abapical infrasutural secondary cord (shoulder)
P1	Shoulder cord
P2-P6	Primary cords of the convex part of the teleoconch whorl
s1-s6	secondary cords of the convex part of the teleoconch whorl
example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.	
ADP	adapertural primary cord on the siphonal canal
MP	median primary cord on the siphonal canal
ABP	abapertural primary cord on the siphonal canal
ads :	adapertural secondary cord on the siphonal canal
ms :	median secondary cord on the siphonal canal
abs :	abapertural secondary cord on the siphonal canal

SYSTEMATIC PALAEONTOLOGY

Superfamily **MURICOIDEA** Rafinesque, 1815
Family **MURICIDAE** Rafinesque, 1815
Subfamily **MURICINAE** Rafinesque, 1815
Genus ***Siratus*** Jousseaume, 1880

Type species. – *Murex senegalensis* Gmelin, 1791, by original designation. Recent, Brazil.

Discussion. As discussed by Barco *et al.* (2010), *Siratus* Jousseaume, 1880 is closer to *Vokesimurex* Petuch, 1994 than it is to *Chicoreus* de Montfort, 1810, and all three should be used at full generic rank. Merle *et al.* (2011, p. 72) discussed the difficulty in separating some species of *Siratus* from *Vokesimurex*. They suggested that well-developed secondary internal denticles and numerous columellar denticles distinguished many *Siratus* from *Vokesimurex*, but that these characters are variable. A more reliable character is the shape of the siphonal canal, which is bent in *Siratus* and straight in *Vokesimurex*. The new species from Cantaure has weak apertural dentition on both lips, which can be present in either genus, but the siphonal canal, although incomplete, is clearly bent, placing it in the genus *Siratus*.

Siratus harzhauseri nov. sp.
Figures 1, 9-11

Dimensions and type material. Holotype; NHMW 2013/0476/0010 (ex BL coll.) (Figs 1, 9-11), height 48.6 mm.

Etymology. Named for Mathias Harzhauser of the Naturhistorisches Museum Wien, friend of the senior author, in recognition of his contributions to palaeomalacology.

Type locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (= locality GS1PGNA of Gibson-Smith & Gibson-Smith, 1979).

Type stratum. Cantaure Formation (late early Miocene: Burdigalian).

Diagnosis. A medium sized *Siratus* species, with a relatively elongated shell, a narrowly canaliculated suture, three varices per whorl bearing short, stout spines placed mid-whorl, with three intervarical axial ridges on early whorls, four with prominent tubercles mid-whorl on last 1½ whorls.

Description. Shell medium-sized, fusiform, spire tall. Protoconch not preserved. Teleoconch of six high, weakly-shouldered whorls, with a narrow, concave, sub-horizontal subsutural area; whorls convex below. Suture impressed, shallowly canaliculated. Three elevated varices per whorl, placed at 120°, aligned almost vertically, bearing a short, stout spine placed just above mid-whorl corresponding to P1, giving whorls a somewhat angular appearance. Intervarical axial sculpture consisting of three nodulose ridges on early whorls, increasing to four on abapical half of penultimate whorl, where the nodules mid-whorl become more prominent. Last whorl fusoid; subsutural area with IP, adis and abis of almost equal strength. Below shoulder P2-P6 narrow, s2-s6 developed in the interspaces between the primary cords. ADP and MP developed on base, ads and ms weaker. Tertiary cords developed throughout between primary and secondary elements. Siphonal canal below ms missing. Aperture of moderate size, ovate. Outer lip convex, margin erect bearing 16 denticles at the inner edge. Labral varix moderately expanded, rounded, bearing straight spine at shoulder. Anal sinus broad, shallow; siphonal canal incomplete, but long,

narrow, open, pointing slightly to left. Columellar lip well delimited, narrowly expanded, adherent adapically, erect abapically, bearing elongated denticles along its entire length.

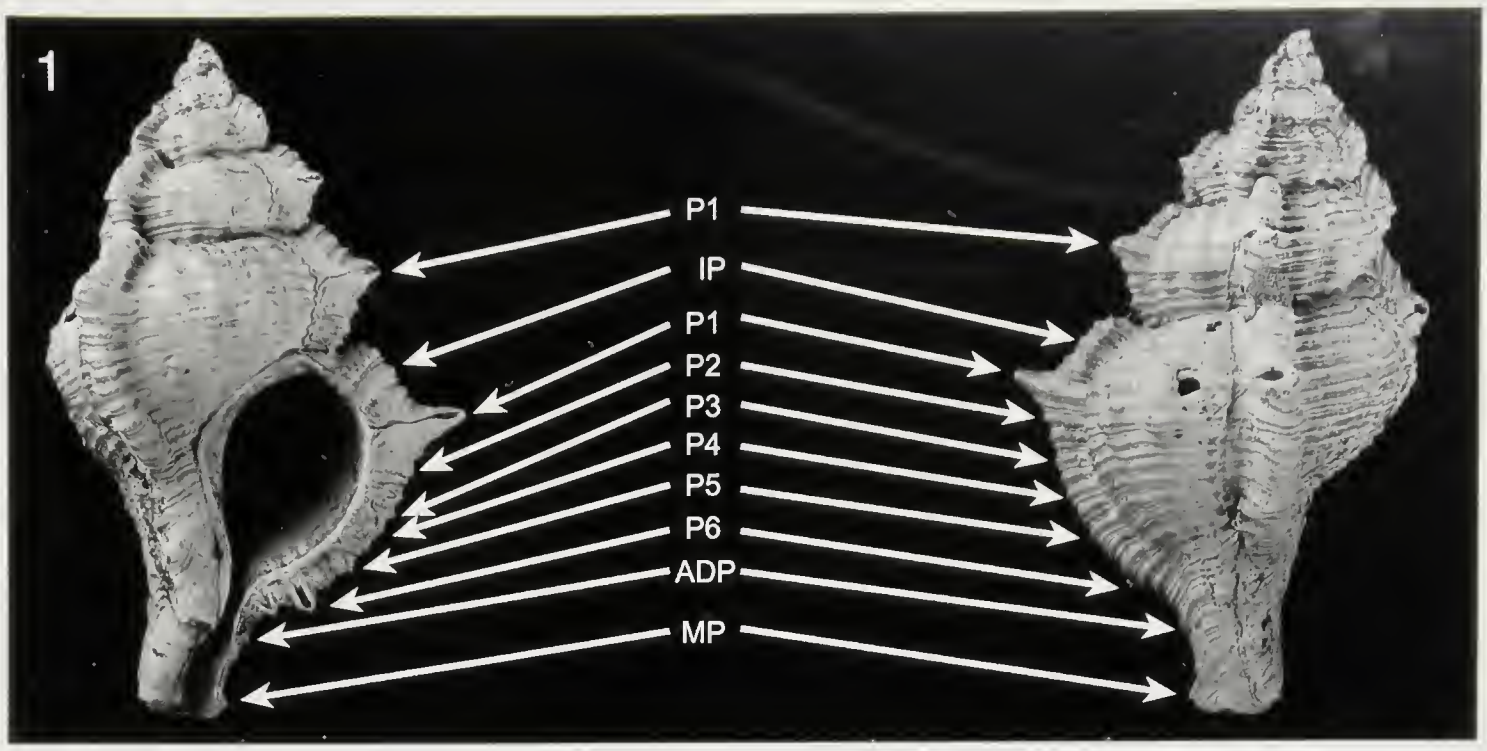


Figure 1. *Siratus harzhauseri* nov. sp., holotype NHMW 2013/0476/0010 (ex BL coll.), height 48.6 mm, 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela, Cantaure Formation, Burdigalian, late early Miocene.

Discussion. *Siratus harzhauseri* nov. sp. is most similar to the Caribbean Pliocene-Recent *S. formosus* (Sowerby, 1841), but differs in having a more elongated fusiform shell shape, in having a shallowly canaliculated suture, in having P1 and hence the shoulder spine placed lower, closer to mid-whorl and shorter, and in having the intervarical axial ridges more strongly nodulose mid-whorl on the last 1½ whorls. *Siratus domingensis* (Sowerby, G. B. I, 1850) from the early Pliocene Gurabo Formation of the Dominican Republic is similar to *S. formosus* and was considered to be ancestral to it by Vokes (1989). Apart for a few exceptionally large specimens, *S. domingensis* is smaller than either *S. formosus* or *S. harzhauseri*, it has smaller spines and a more recurved siphonal canal. *Siratus domingensis* has three-five intervarical axial ridges, which are narrower and the suture is not canaliculated. *Siratus articulatus* (Reeve, 1845) from the Pliocene-Recent Caribbean can easily be separated as P1, P3, P5 and P6 form more or less long spines at the apertural varix and the suture is not canaliculated. Another closely similar species is the early Pleistocene to Recent Caribbean *Siratus springeri* (Bullis, 1964), but this species differs from *S. harzhauseri* in having convex rather than angular whorl profile, in having only two or three axial intervarical ridges, in having the labral varix deeply excavated on the abapertural side, and in most specimens P1, P5, P6 are strongly developed.

Two further *Siratus* species occur in the Cantaure assemblage: *S. quirosensis* (F. Hodson, 1931), which is much smaller than *S. harzhauseri*, with only two axial intervarical ridges that are more prominent than in *S. harzhauseri*, and P1, P3 and P5 are strongly developed. The second, *Siratus denegatus* (Jung, 1966), is quite different from all its congeners in having a rather triangular shell, a sharply carinate last whorl, only one axial intervarical ridge, very fine spiral sculpture, and P1 developed into a short, sharp spine at the shoulder.

Genus ***Phyllonotus*** Swainson, 1833

Type species. – *Murex imperialis* (var. a) Swainson, 1833, by subsequent designation, Swainson, 1833, pl. 109 (= *Murex imperialis* Swainson, 1831) (not Fischer de Waldheim, 1807) (= *Murex margaritensis* Abbott, 1958). Recent, West Atlantic.

Phyllonotus* sp. cf. *P. infrequens (Vokes, 1963)
Figures 12-13

cf. 1963. *Murex* (*Phyllonotus*) *infrequens* Vokes, p. 156, pl. 1, fig. 4.

Material. 1 specimen NHMW 2013/0476/0011 (ex BL coll.), height 35.3 mm (Figs 12-13).

Locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela, Cantaure Formation, Burdigalian, late early Miocene.

Discussion. This specimen resembles the species illustrated by Vokes (1989, 1990) as *Phyllonotus infrequens* from the Early Miocene Baitoa Formation of the Dominican Republic. However *Phyllonotus*

infrequens from the Early Miocene Chipola Formation of Florida has a more globose shell with a less impressed suture, a more rounded aperture and less conspicuous secondary and tertiary spiral cords. The specimen from the Baitoa Formation and our specimen from the Cantaure Formation are somewhat related, although the Cantaure one is more globose, has a more impressed suture and a narrower siphonal canal.

Genus ***Purpurellus*** Jousseaume, 1880

Type species. – *Murex gambiensis* Reeve, 1845, by original designation. Recent, West Africa.

Emerson & D'Attilio (1969) demonstrated that, on the basis of radular morphology, *Purpurellus* Jousseaume, 1880 was closely related to *Pterynotus*. *Purpurellus* differs from *Pterynotus* in having a sealed siphonal canal and an operculum with a central nucleus, instead of apical in *Pterynotus s.s.* The use of the taxon at full generic rank is now generally accepted (Landau *et al.*, 2007, Merle *et al.*, 2011, Bouchet & Houart, 2013).

Purpurellus* sp. cf. *P. repetiti (Vokes, 1970)
Figures 14-17

cf. 1970 *Pterynotus (Purpurellus) repetiti* Vokes, p. 16, pl. 3, fig. 4.

Material. 1 incomplete specimen, NHMW 2013/0476/0008 (ex BL coll.), height 27.2 mm (Figs 14-15); 1 incomplete specimen, NHMW 2013/0476/0009 (ex BL coll.), height 32.4 mm (Figs 16-17).
Locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (=locality GS1PGNA of Gibson-Smith & Gibson-Smith, 1979), Cantaure Formation (early Miocene: Burdigalian).

Discussion. Vokes (1989, p. 55) commented that *Purpurellus* species could be difficult to separate. The two incomplete specimens illustrated here resemble the specimen described as *Purpurellus repetiti* (Vokes, 1970) from the "Silverdale Beds" of North Carolina, originally considered Early Miocene, but placed in the Late Oligocene Chickasawhayan Stage by Gibson (1977, p. 202; 1983, p. 38). This species is characterised by its relatively tall spire, moderately expanded varices, with short straight spines at the shoulder, single sharp intervarical node, and very weak spiral sculpture. It is most like the European Miocene-Pliocene *Purpurellus veranyi* (Paulucci, 1866) (see Landau *et al.*, 2007; Merle *et al.*, 2011), but this species has broader intervarical nodes and a relatively smaller, more circular aperture. Apart from these constant differences, most specimens of *P. veranyi* are broader, have stronger, recurved spines at the shoulder, slightly more prominent spiral sculpture, and more expanded labral varix. However, given the badly preserved material from the Cantaure Formation and the few specimens involved, the identification remains doubtful.
The only other western Atlantic congener is *Purpurellus mirificus* Vokes, 1989 from the early Pliocene Gurabo Formation of the Dominican Republic, which is quite different from *P. repetiti* and *P. veranyi* in having greatly expanded wing-like varices, similar to the Recent West African *P. gambiensis* (Reeve, 1845).
In Europe the fossil record also starts in the Late Oligocene with an undescribed species listed by Lozouet (1986, p. 377) from the Atlantic Late Oligocene of France. Today *Purpurellus* has a disjunct distribution, *P. gambiensis* (Reeve, 1845) from West Africa and two species, *P. pinniger* (Broderip, 1833) and *P. macleani* (Emerson & D'Attilio, 1969) from the Pacific coast of Tropical America. In the fossil record, specimens of *Purpurellus* are always rare, and although the first record is Late Oligocene in both the eastern and western Atlantic, it is likely that the genus is a Palaeogene offshoot of *Pterynotus*, which originated in the Tethys, immigrated to the western Atlantic and colonised the Tropical American Pacific before the closure of the central American Seaway, subsequently dying out in the western Atlantic.

Subfamily **OCENEBRINAE** Cossmann, 1903
Genus ***Ocenebra*** Gray, 1847

Type species. – *Murex erinaceus* Linnaeus, 1758, by monotypy. Recent, northeastern Atlantic, Mediterranean.

Ocenebra etteri nov. sp.
Figures 18-23

Dimensions and type material. Holotype, NHMW 2013/0476/0018 (Figs 20-21), height 22.3 mm; paratype 1, NHMW 2013/0476/0017 (Figs 18-19), height 17.5 mm; paratype 2, 2013/0476/0019, height 22.4 mm; paratype 3, NHMW 2013/0476/0021, height 12.1 mm.

Other material. NHMW 2013/0476/0020 (1), height 14.0 mm, juvenile (Figs 22-23).

Etymology. Named after Dr. Walter Etter of the Naturhistorisches Museum Basel, Switzerland, in recognition of his help and support.

Type locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (= locality GS1PGNA of Gibson-Smith & Gibson-Smith, 1979).

Type stratum. Cantaure Formation (late early Miocene: Burdigalian).

Diagnosis. A medium sized *Ocenebra* species with a strongly nodulose shoulder, three varices per whorl on the last three whorls, with one intervarical node, spiral cords P1-P5 equal in strength, P6 slightly narrower, with a single intercalated secondary cord, aperture small with very shallow ID and strong D1-D5 within and a short, sealed siphonal canal.

Description. Shell medium sized, heavy, nodose. Subsutural ramp broad, weakly sloping, slightly concave. Spire high with teleoconch up to five or six strongly shouldered, nodose whorls. Suture adpressed. Protoconch unknown. Axial sculpture of teleoconch whorls consisting of high ribs and high, broad, varices. Each varix with short, blunt nodes extending from primary spiral cords. Antepenultimate, penultimate and last whorls with three varices and a single, strong, prominent, intervarical node. Other spire whorls with narrow axial ribs. Last whorl broad. Subsutural area with adis, IP, abis, followed on convex part of whorl by P1, s1, P2, s2, P3, s3, P4, s4, P5, s5, P6, s6; ADP and MP on siphonal canal. P1-P6 almost similar in size and strength, P6 weakly narrower. Secondary cords obviously narrower than primary cords. Siphonal canal below MP missing or damaged. Aperture moderately small, ovate. Columellar lip narrow, smooth, adherent. Anal notch shallow, broad. Outer apertural lip with very shallow ID and strong D1-D5 within. Labral varix rounded, strong, broad, with small nodes. Siphonal canal short, narrow, ventrally sealed, partly broken.

Discussion. Vermeij & Vokes (1997, p. 72) restrict the genus *Ocenebra* to "a relatively small number of Miocene to Recent species from western Europe, the Mediterranean region and Tropical West Africa. These are characterized by the tendency to form three varices on the last whorl, by the presence of six to eight primary spiral cords on the last whorl, a crenulated outer lip without a labral tooth, an adherent or very lightly erect inner lip, and six weak to strong denticles on the inner side of the outer lip. In species with varices, the latter are separated from each other by a single intervarical node".

The Tropical West African species are now classified in other genera. However, Houart & Sirenko (2003) also assigned three Recent and fossil species from the northwestern Pacific to *Ocenebra*.

Two more or less related species were assigned to *Miocenebra*: *M. silverdalensis* (Vokes, 1963) and to *Fenoligmum*: *F. umbilicatum* Vermeij & Vokes, 1997, by Vermeij & Vokes (1997), both species from the Belgrade Formation, North Carolina.

This is the first occurrence of the genus *Ocenebra* in the tropical western Atlantic and therefore this new species cannot be compared to any Caribbean fossil or Recent taxon. *Ocenebra etteri* nov. sp. is far more reminiscent of some of the Early Miocene Aquitanian and Burdigalian species from the French Aquitaine Basin (see Lozouet *et al.*, 2001, pl 22, 23).

Genus ***Vitularia*** Swainson, 1840

Type species. – *Murex miliaris* Gmelin, 1791, by monotypy. Recent, western Indo-Pacific.

Note. – The placement of this genus in the Ocenebrinae Cossmann, 1903 is provisional, as molecular data presented by Barco *et al.* (2010) showed the subfamily to be polyphyletic.

Vitularia* sp. cf. *V. salebrosa
(King & Broderip, 1832)
Figures 24-27

cf. 1832 *Murex salebrosa* King & Broderip, p. 347.

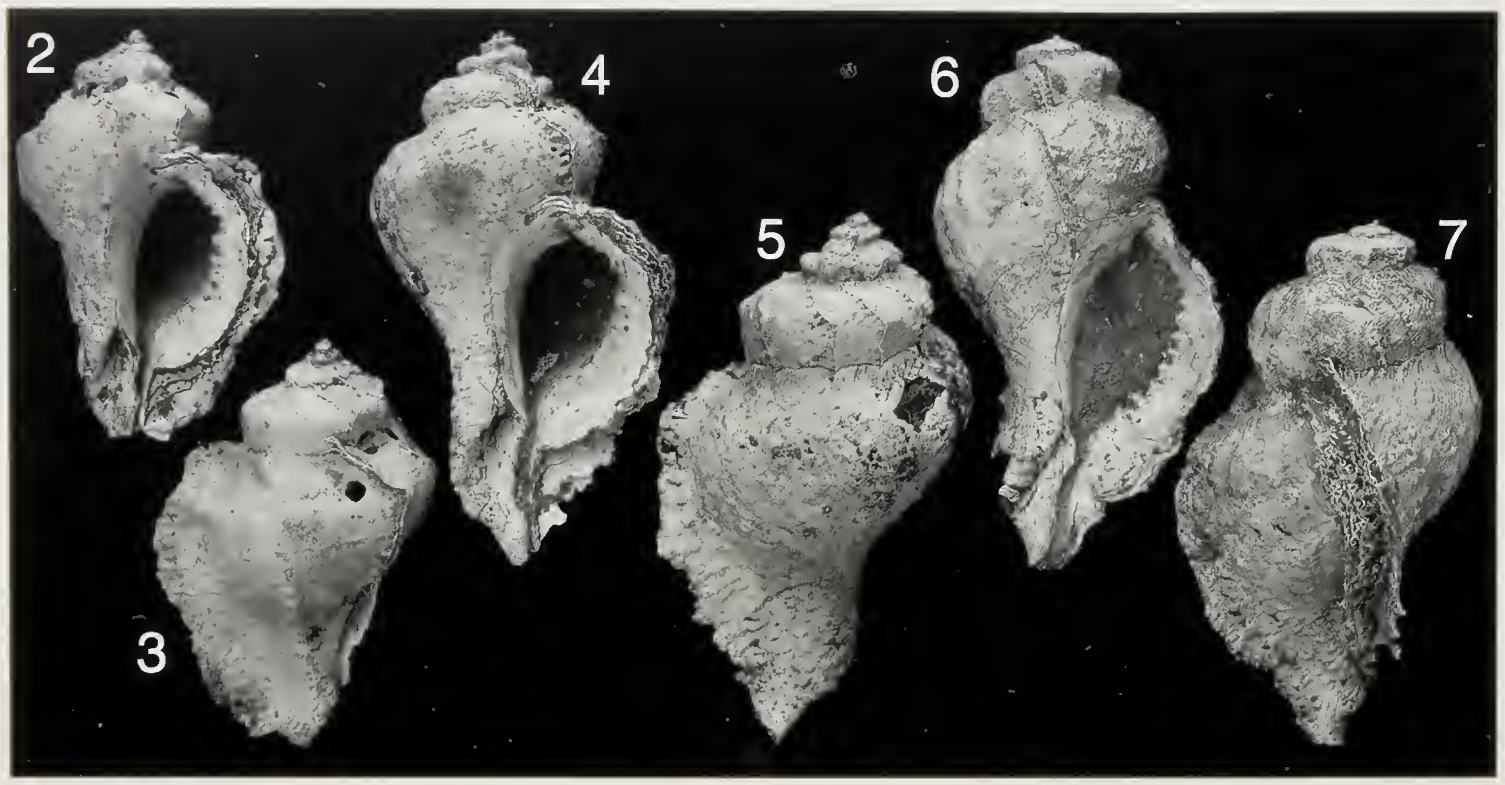
Material. 1 incomplete specimen, NHMW 2012/0197/0008 (ex BL coll.), height 29.1 mm (Figs 24-25); 1 incomplete specimen, NMB H20169, NMB locality 12842, height 72.2 mm (Figs 26-27).

Locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (= locality GS1PGNA of Gibson-Smith & Gibson-Smith, 1979), Cantaure Formation (early Miocene: Burdigalian).

Discussion. A *Vitularia* species occurs in the Cantaure formation, which is difficult to characterise as only two incomplete specimens are available to us, and they are somewhat different from each other. The first of these is smaller and probably represents a subadult stage (Figs 24-25). The shell is slender and the spire high. The carina on the spire whorls is sharp and runs mid-whorl. The subsutural ramp is broad and weakly concave, below the carina the whorl is straight-sided and tapers inwards to the suture. The axial sculpture consists of eight prosocline ribs developed into prominent rounded tubercles at the shoulder. The ribs cross the subsutural ramp as narrow lamellae. The surface is pustulose, a feature of the genus. Unfortunately the adapical portion of the last whorl and aperture are missing. This is the specimen discussed by Landau *et al.* (2013). The second specimen (Figs 26-27) is larger, but strongly abraded and incomplete. The spire is also high, and the shoulder bears rounded tubercles. However, it differs in the position of the carina on the spire whorls, which is closer to the adapical suture, giving the spire a conical rather than scalate shape. The two *Vitularia* specimens from Cantaure probably represent a single species, as these differences in the position of the suture and spire shape can also be seen in the European Miocene *Vitularia linguabovis* (Basterot, 1825) (Landau *et al.*, 2013).

The genus is not speciose. In the Caribbean faunas only two species are known. *Vitularia dominicana* Vokes, 1989 from the early Pliocene Gurabo Formation of the Dominican Republic is low spired, and according the illustrated holotype, has large round

tubercles at the shoulder, which is placed high on the last whorl. At the time of description only three specimens were available to Emily Vokes, with a maximum height of 28.2 mm. Subsequent collections made by the senior author have brought further specimens to light, which attain a greater maximum height of 53.9 mm. As the shell increases in size the penultimate and last whorls become rounded and lose the tubercles at the shoulder. In the largest specimens from the Dominican Republic the shoulder of the last whorl is rounded and quite smooth. In view of these important and, so far undocumented ontogenic changes, we take the opportunity to illustrate further specimens from the Dominican Republic (Figures 2-7).



Figures 2-7. *Vitularia dominicana* Vokes, 1989, Tulane locality 1215 (see Vokes, 1989), Gurabo River, Gurabo Formation, Lower Pliocene, Dominican Republic. Figs 2-3 NHMW 2013/0476/0005, height 40.8 mm; figs 4-5 NHMW 2013/0476/0006, height 53.7 mm; figs 6-7 NHMW 2013/0476/0007, height 49.5 mm.

Vokes (1989) compared the Dominican shell to the Recent Indo-Pacific species *Vitularia miliaris* (Gmelin, 1791), but large specimens of this species always have large tubercles at the shoulder, which remains angular and placed high on the last whorl.

The second species is *Vitularia salebrosa* (King & Broderip, 1832) (= *V. ecuadoriana* Marks, 1951 = *V. linguabison* Vokes, 1967). This species occurs in the Caribbean Neogene in the late Pliocene Agueguexquite Formation of Mexico and Pinecrest Formation of Florida, in the Panamic faunas from the early Pliocene Esmeraldas Group of Ecuador, through the Pleistocene of Baja California, Ecuador and the Galapagos, and is found today from Baja California to Peru. It is one of the paciphile species discussed by Landau *et al.* (2009). *Vitularia salebrosa* is tall-spired, like the Cantaure specimens, but seems to have smaller and more numerous tubercles at the shoulder.

Vitularia linguabovis (Basterot, 1825), which occurs in the early-late European Miocene, is broader, usually with a less elevated spire, and more numerous tubercles at the shoulder. We wait in the hope of finding better specimens from Cantaure, which is the earliest occurrence of the genus in the tropical American Neogene assemblages.

Subfamily **TYPHINAE** Cossmann, 1903
Genus ***Typhina*** Jousseaume, 1880

Type species. – *Typhis belcheri* Broderip, 1833 (= *Murex cleryi* Petit, 1840) by original designation, Recent, West Africa and Brazil.
= *Talityphis* Jousseaume, 1882

Talityphis Jousseaume, 1882 and *Typhina* Jousseaume, 1880 were considered congeneric by Houart (2002).

Typhina canaliculata nov. sp.
Figures 8, 28-34

Dimensions and type material. Holotype; NHMW 2013/0476/0001 (ex BL coll.) (Figs 28-31), height 28.6 mm; paratype 1; NHMW 2013/0476/0002 (ex BL coll.) (Figs 8, 32-34), height 23.8 mm; paratype 2; NHMW 2013/0476/0003 (ex BL coll.), height 28.9 mm. paratype 3 NMB H20171 (NMB locality 17520), height 19.9 mm; paratype 4 NMB H20170 (NMB locality 17516), height 27.9 mm; paratype 5 NMB H19068 (NMB locality 17516), height 27.7 mm.

Other material. Maximum height 30.3 mm; 10 specimens NHMW 2013/0476/0004 (ex BL coll.), NMB locality 17516 NMB coll. (6), same locality.

Etymology. Name reflecting the deeply canaliculated suture seen in this species.

Type locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (= locality GS1PGNA of Gibson-Smith & Gibson-Smith, 1979).

Type stratum. Cantaure Formation (late early Miocene: Burdigalian).

Diagnosis. A medium-sized *Typhina* species, with a relatively high spire, strongly concave subsutural area resulting in a deeply canaliculated suture, four varices per whorl, short tubes, five weakly developed spiral cords forming weakly recurved spines on the varices, and a moderately expanded labral varix.

Description. Shell medium-sized, stout; spire relatively high. Protoconch not preserved. Six or seven sharply-angular, straight-sided teleoconch whorls, with narrow, deeply concave subsutural area. Suture impressed, deeply canaliculated. Four varices per whorl. Tubes (P1) of moderate length, pointing laterally and abaperturally, placed closer to preceding than succeeding varices. A laminar partition above the aperture crossing the shoulder joins the varix to the varix of the preceding whorl. Below tube shell surface very weakly swollen and two lines pass anteriorly, one being the margin of the old mouth, the other, in advance of the tube, being similar in character and indicating another arrest in growth. P2-P6 weakly developed, forming small, posteriorly-reflected spines over the varices. Surface bearing faint growth lines. Aperture small, ovate, bordered by raised rim; labral varix constant in width, moderately expanded, consisting of inner band bearing spiral cords and outer flange with a scalloped edge formed by spines at termination of P2-P6. Siphonal canal closed, broad, relatively short, pointing to the right and abaperturally.

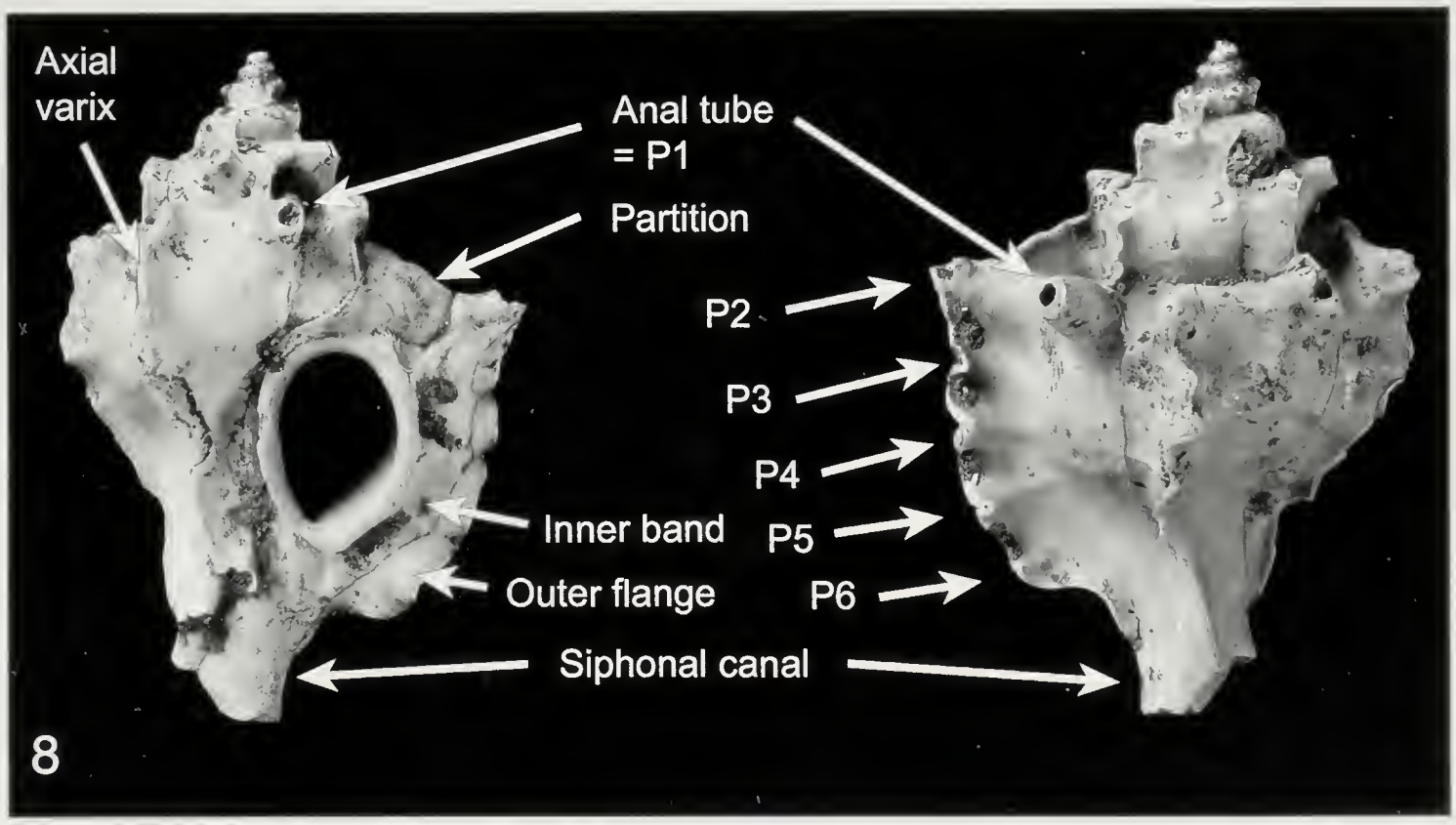


Figure 8. *Typhina canaliculata* nov. sp., paratype 1 NHMW 2013/0476/0002 (ex BL coll.), height 23.8 mm, 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela, Cantaure Formation, Burdigalian, late early Miocene.

Discussion. The four varices and tubes per whorl, the tubes being placed closer to the preceding than succeeding varix, the apertural varix greatly expanded and the partition above the aperture place this new species in the genus *Typhina* Jousseaume, 1880.

Typhina canaliculata nov. sp. resembles the Recent and type species *T. belcheri* (= *T. cleryi*) but it differs in having a comparatively larger shell with a higher spire, a straighter, less upward bent and shorter P2 spine instead of long and strongly adapically recurved in *T. belcheri*, a more sculptured, more strongly folded apertural varix and a comparatively broader siphonal canal.

Typhina canaliculata nov. sp. is also closely similar to *Typhina obesa* (Gabb, 1873), which is widespread in the Caribbean early Miocene (Vokes, 1989), but differs in being less broad and in having a taller spire, whereas *T. obesa* has a very short, depressed spire. The subsutural area in *T. obesa* is broad and weakly concave, whereas in *T. canaliculata* it is narrower and

strongly concave, resulting in a deeply canaliculated suture, bordered by a high-ridged shoulder. In *Typhina canaliculata* the spiral cords are more strongly developed than in *T. obesa*, forming short recurved spines at the varices on the last whorl. In *T. obesa* the spiral sculpture is very weakly developed, hardly marked over the sharp, straight varices. Lastly, the aperture is relatively smaller and the labral varix narrower than in *T. obesa*. *Typhina expansa* (Sowerby, 1874) from the early Pliocene to Recent Caribbean, is very closely similar to *T. obesa* (differences between the two were discussed by Vokes, 1989, p. 332), but this species can also be distinguished from *T. canaliculata* in having a broader shell shape and in having a wider apertural varix, but above all by the less concave subsutural area. *Typhina alata* (Sowerby, 1850) from the early Pliocene Gurabo Formation of the Dominican Republic and Pliocene formations of Ecuador differs in having a more fusiform shell shape, a less depressed subsutural area, a wider labral varix and in forming an intervarical node below the tubes, a character not seen in *T. obesa*, *T. expansa* or *T. canaliculata*.

The earliest member of the genus in the Caribbean was thought to be *Typhina precursor* (Keen & Campbell, 1964) from Las Perdices Shale of Colombia, which, according to Gertman (1969), was dated as Aquitanian early Miocene. This species also occurs in the Manzanilla Formation of Trinidad, dated by Gertman as early Miocene. The age of the Las Pedices Group is now considered middle-late Miocene (Landau *et al.*, 2012, chart 2), and the Manzanilla Formation is considered to be late Miocene (Landau *et al.*, 2012, chart 15). *Typhina precursor* is a very large solid species, 47-49 mm in height, which also seems to have a narrow shoulder, but differs importantly from *T. canaliculata* and other *Typhina* species in having no spiral sculpture developed.

Other Caribbean congeners are: *Typhina pterina* (Gardner, 1947) from the middle Miocene Shoal River Formation of Florida and *T. eucteana* (Woodring, 1970) from the late Miocene Gatun formation of Panama, which are both much smaller, with a more fusiform shell shape. The subsutural area in both of these is concave, but not as deep as in *T. canaliculata*. *Typhina eucteana* is further distinguished by its long, narrow siphonal canal. *Typhina siphon* (Woodring, 1928) from the Pliocene Bowden Formation of Jamaica is a more slender, fusiform species, with recurved spines at the shoulder, and a longer siphonal canal. *Typhina acuticosta* (Conrad, 1830) from the middle Miocene St. Mary Formation of Maryland and late Miocene Choctawhatchee Formation of Florida is quite different, with a slender shell shape and acutely angled, straight-sided whorls. *Typhina carmenae* (Gertman, 1969) from the late Pliocene Agueguexquite Formation of Mexico has a broader shell shape, more prominent spiral sculpture and a far more expanded apertural varix than *T. canaliculata*. The Recent Panamic *Typhina latipennis* (Dall, 1919) has weaker spiral sculpture than the fossil Cantaure species, and a greatly expanded flange on the apertural varix.

Genus ***Laevityphis*** Cossmann, 1903

Type species. – *Typhis coronarius* Deshayes, 1865 [*Laevityphis muticus* (Sowerby, 1835)], by original designation. Eocene, France.

Laevityphis jungi nov. sp.
Figures 35-38

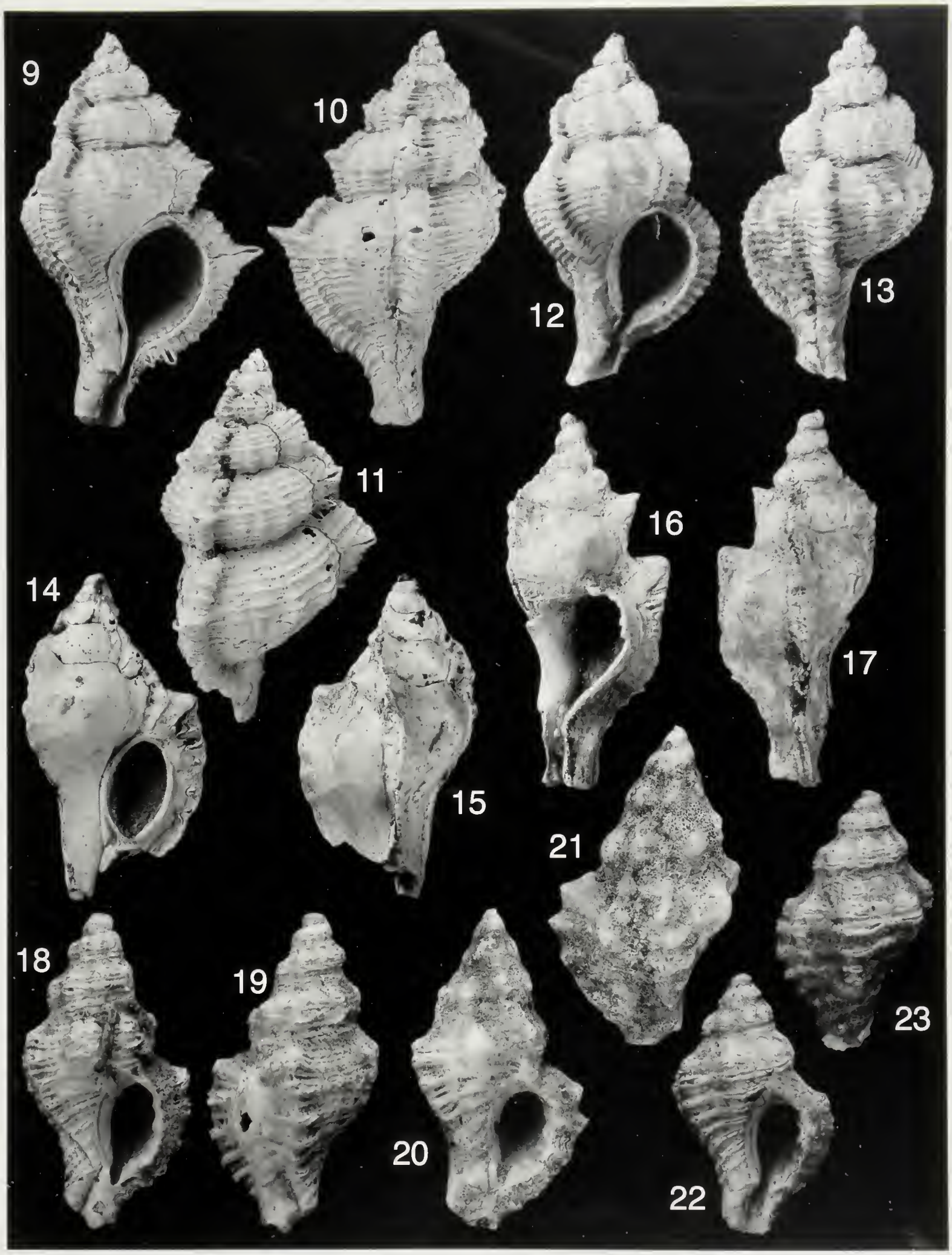
Typhis (Laevityphis) sawkinsi. Jung, 1965, p. 525, pl. 70, figs 7, 8 [not *Laevityphis sawkinsi* (Mansfield 1925)].

Dimensions and type material. Holotype; NHMW 2013/0476/0012 (ex BL coll.) (Figs 35-36), height 28.3 mm; paratype 1; NHMW 2013/0476/0013 (ex BL coll.) (Figs 37-38), height 27.0 mm; paratype 2; NHMW 2013/0476/0014 (ex BL coll.), height 27.1 mm; paratype 3; NHMW 2013/0476/0015 (ex BL coll.), height 23.8 mm; paratype 4 NMB H18542, height 23.0 mm; paratype 5 NMB H18543, height 20.7 mm; paratype 6 NMB H13719, height 23.0 mm [specimen figured by Jung, 1965, pl. 70, figs 7, 8 as *Typhis (Laevityphis) sawkinsi* Mansfield].

Figures 9-23

9-11. *Siratus harzhauseri* nov. sp., holotype NHMW 2013/0476/0010 (ex BL coll.), height 48.6 mm.
12-13. *Phyllonotus* sp. cf. *P. infrequens* (Vokes, 1963), NHMW 2013/0476/0011 (ex BL coll.), height 35.3 mm.
14-17. *Purpurellus* sp. cf. *P. repetiti* (Vokes, 1970)
14-15. NHMW 2013/0476/0008 (ex BL coll.), height 27.2 mm; **16-17.** NHMW 2013/0476/0009 (ex BL coll.), height 32.4 mm.
18-23. *Ocenebra etteri* nov. sp.
18-19. Paratype 1, NHMW 2013/0476/0017, height 17.5 mm; **20-21.** Holotype, NHMW 2013/0476/0018, height 22.3 mm; **22-23.** Juvenile, NHMW 2013/0476/0020, height 14.0 mm.

All: 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela, Cantaure Formation, Burdigalian, late early Miocene.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Other material. Maximum height 31.7 mm; 20 specimens NHMW 2013/0476/0016 (ex BL coll.), NMB locality 17516 NMB coll. (66), NMB locality 17520 NMB (100+), same locality.

Etymology. Named in honour or Peter Jung, in recognition of his work on the Cantaure assemblage.

Type locality. 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (= locality GS1PGNA of Gibson-Smith & Gibson-Smith, 1979).

Type stratum. Cantaure Formation (late early Miocene: Burdigalian).

Diagnosis. A medium-sized *Laevityphis* species, with a high spire, a narrow, concave subsutural area, four varices per whorl placed in the middle of the intervarical area, bearing spines pointing adapically and inwards, short tubes in the intervarical spaces, an almost smooth surface, a small aperture, a narrowly expanded labral varix, and a long, narrow siphonal canal.

Description. Shell medium-sized, elongate; spire high. Protoconch paucispiral, consisting of two elevated, bulbous whorls. Six or seven sharply-angular teleoconch whorls, with narrow, concave, sub-horizontal subsutural area, weakly convex below shoulder to suture. Suture impressed, undulating. Four simple, convex varices per whorl, with a large, sharp spine at the shoulder of each varix pointing adapically and inwards; end usually broken away and appearing as small tube-like structures, but not connecting to interior of shell. Tubes (P1) of moderate length, separated from varices, pointing laterally and abaperturally, placed in the middle of the intervarical area. A ridge running abapically from the tube dividing the intervarical area into two almost equal halves. Last whorl relatively short, convex, strongly constricted at the base. P2-P6 not clearly developed, very weak spiral sculpture just visible on penultimate and last whorls. Aperture small, ovate, bordered by raised rim; labral varix constant in width, moderately expanded. Siphonal canal closed, narrow, long, pointing to the right and abaperturally at distal end.

Discussion. The four varices and tubes per whorl, the tubes not being attached to the varix, the varix bearing a spine pointing apically and the narrowly expanded apertural varix place this new species in the genus *Laevityphis* Cossmann, 1903 (Gertman, 1969). In this genus the tube is usually placed closer to the succeeding than the preceding varix, although in *Laevityphis jungi* nov. sp. the tube is placed almost midway between the varices.

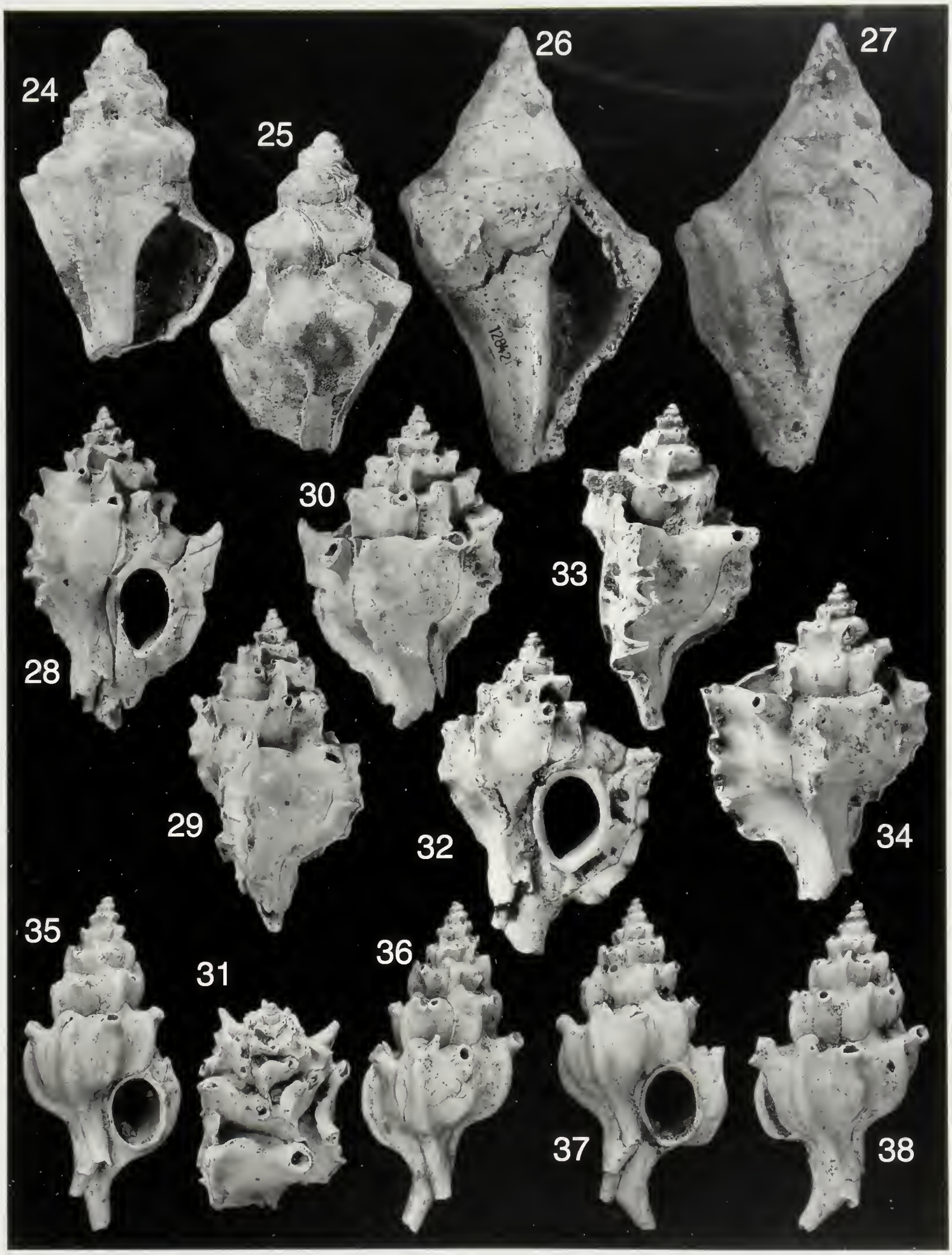
This species was first identified by Jung (1965) as *Typhis (Laevityphis) sawkinsi* (Mansfield, 1925) from the early-middle Miocene Brasso Formation of Trinidad, although the author noted that the Cantaure shells were not identical with those from Trinidad. When compared to the holotype figured by Gertman (1969, pl. 7, fig. 1), the Trinidadian species is much stockier, with a far shorter spire, the varices are far wider and more prominent than in *L. jungi*, the base is less strongly constricted and the siphonal canal is broader and shorter than in the Venezuelan species.

The fact that the Venezuelan and Trinidadian species were not conspecific was noted by Vokes (1989, p. 81), who considered the Cantaure shells to be a rather large variant of *Laevityphis linguiferus* (Dall, 1890) a species common in the early Miocene Chipola Formation of Florida. Indeed, Vokes (1989) considered the two identical, apart from their size. We have compared the Cantaure material with numerous specimens of *L. linguiferus* from the Chipola Formation and cannot agree with this conclusion. *Laevityphis jungi* is indeed a much larger shelled species, adults ranging from 22.7 mm – 31.7 mm in height, whereas the largest specimens of *L. linguiferus* do not attain 15 mm in height. Further differences can be seen in the spire, which is much taller in the Venezuelan species and the last whorl, which is more

Figures 24-38

24-27. *Vitularia* sp. cf. *V. salebrosa* (King & Broderip, 1832)
24-25. NHMW 2012/0197/0008 (ex BL coll.), height 29.1 mm; **26-27.** NMB H12842, height 72.2 mm.
28-34. *Typhina canaliculata* nov. sp.
28-31. Holotype; NHMW 2013/0476/0001 (ex BL coll.), height 28.6 mm; **32-34.** Paratype 2; NHMW 2013/0476/0003 (ex BL coll.), height 28.9 mm.
35-38. *Laevityphis jungi* nov. sp.
35-36. Holotype; NHMW 2013/0476/0012 (ex BL coll.), height 28.3 mm; **37-38.** Paratype 1; NHMW 2013/0476/0013, (ex BL coll.), height 27.0 mm.

All: 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela, Cantaure Formation, Burdigalian, late early Miocene.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constricted at the base. The proximal end of the siphonal canal is proportionally broader in *L. linguiferus* than in *L. jungi*, but then narrows rapidly at the distal end to form a very small siphonal exit, whereas in *L. jungi* the narrowing in gradual and the siphonal exit proportionally wider. The sculpture, or lack of it, is similar in both species.

Several congeners occur in the tropical American fossil record. The oldest member of the group, *L. gracilis* (Conrad, 1833) from the late middle Eocene Gosport Formation of Alabama, USA also has a slender shell and tall spire, but is distinguished by its crenulated varices. The other Miocene and Pliocene congeners, such as *L. costaricensis* (Olsson, 1922), *L. bullisi* (German, 1969), *L. apheles* (Vokes, 1989) and *L. spinirectus* (Vokes, 1989) all differ in having smaller, less slender shells with lower spires.

Acknowledgements

We would like to thank Emily Vokes for her comments and for acting as referee. Also to Walter Etter and Olivier Schmidt of the Naturhistorisches Museum Basel, Switzerland, for access to the PPP collection.

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New species and new records of Calliostomatidae (Gastropoda: Trochoidea) from eastern and central Indo-Pacific

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KEYWORDS. Gastropoda, Calliostomatidae, Tonga Islands, Austral Archipelago, Vanuatu, Solomon Islands, *Calliostoma*, new species.

ABSTRACT. New records of five known Calliostomatidae species from eastern and central tropical Pacific are listed, extending the distribution area of some of them. Four new species are described and compared with similar species: *Calliostoma haapaiensis* n. sp., *C. vaubanoides* n. sp., *C. mesemorinon* n. sp. and *C. polysarkon* n. sp.

RESUME. De nouveaux relevés de cinq espèces connues de Calliostomatidae provenant de l'est et du centre du Pacifique tropical sont listés, étendant ainsi l'aire de distribution d'un certain nombre d'entre elles. Quatre nouvelles espèces sont décrites et comparées avec des espèces similaires : *Calliostoma haapaiensis* n. sp., *C. vaubanoides* n. sp., *C. mesemorinon* n. sp. et *C. polysarkon* n. sp.

INTRODUCTION

The malacofauna, especially Trochoidea species, of eastern tropical Pacific is still rather poorly known. Only a few dredging, like those of IRD (Institut de Recherche pour le Développement, Paris - ex-ORSTOM) and MNHN (Muséum national d'Histoire naturelle, Paris) campaigns in French Polynesia (Vilvens, 2012) or in Tonga Islands (Vilvens, 2005), and local samplings (Stratmann & Stahlschmidt, 2007, Vilvens, 2009a) have brought a limited amount of samples.

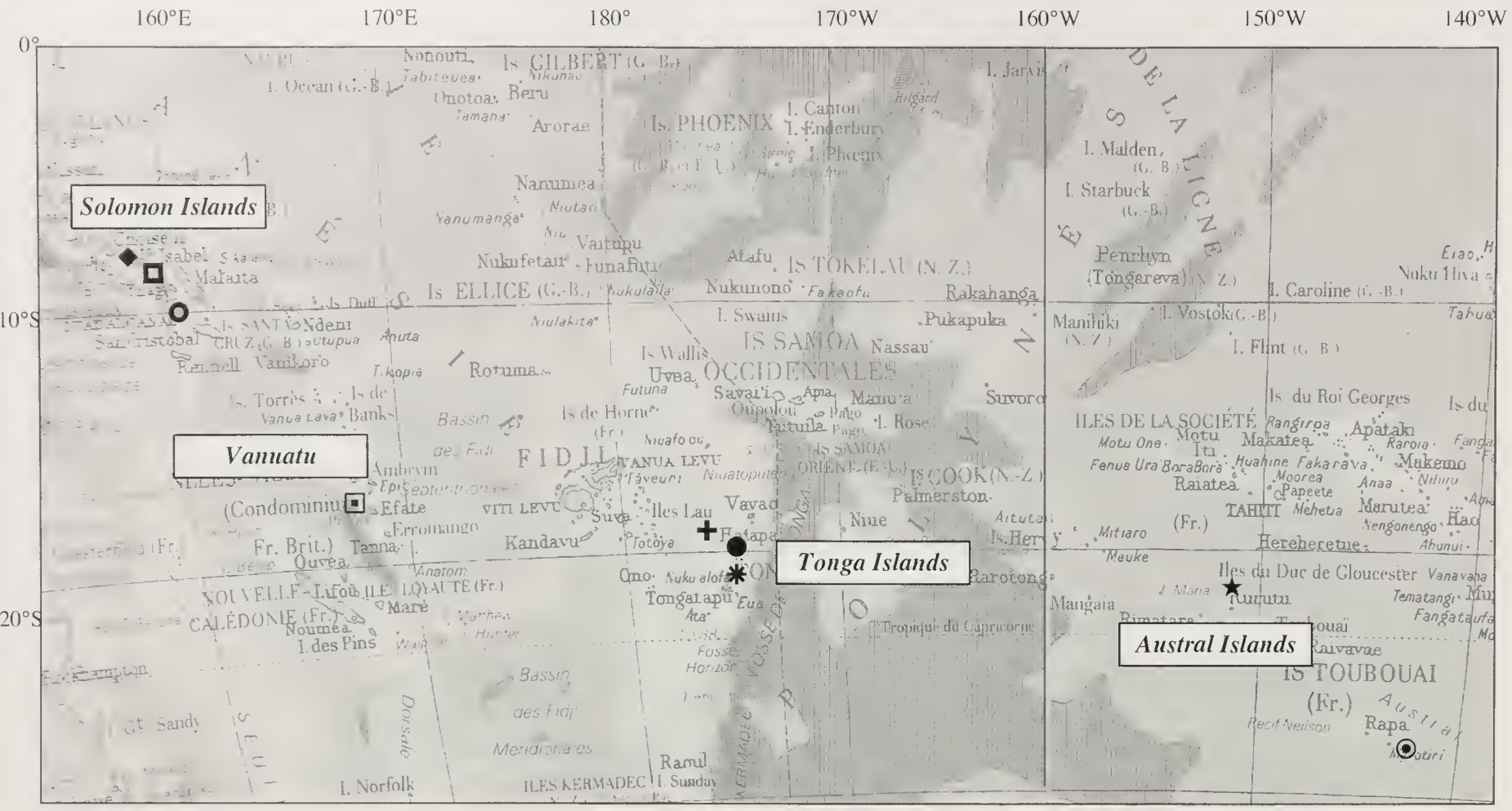
On the contrary, numerous campaigns have been conducted in central tropical Pacific, especially again the ones organized by IRD-MNHN in New Caledonia, Vanuatu, Fiji and Solomon Islands, bringing a huge material (Héros et al., 2007; Bouchet et al., 2008), notably Calliostomatidae (Trochoidea) samples with numerous new species (e.g.: Marshall, 1995; Vilvens, 2009b).

While studying various Trochoidea and Seguenzoidea from all these campaigns, a few Calliostomatidae samples were found among other trochids samples, bringing additional records of known species but also more surprisingly some new species. The present paper presents the results of this recent study.

Material and methods

The material studied in the present paper was brought mainly by some IRD-MNHN expeditions: BORDAU 2 (6/2000), BENTHAUS (11/2002), SALOMON 2 (10-11/2004), BOA 1 (9/2005) and SALOMONBOA 3 (9-10/2007) (see Map 1).

Regarding the distribution of the new species and the extension of the distribution of known species, the range is taken from the internal intervals of the two extremes values. This range of the known and new species is provided for all the available specimens and also for the only living specimens if they have been found; when these ranges are the same, the common range is cited once with the "(living)" annotation; if all the specimens are dead collected, the range is cited with the "(dead)" annotation.



Map 1. Records of cited Calliostomatidae species in eastern and central tropical Pacific :

★ *Calliostoma mesemorinon* n. sp. (BENTHAUS)
⦿ *C. paradigmatum* Marshall, 1995 (BENTHAUS)
✱ *C. arx* Vilvens, 2005 (BORDAU 2)
✚ *C. haapaiensis* n. sp. (BORDAU 2)
● *C. vaubanoides* n. sp. (BORDAU 2)
◆ *C. hexalyssion* Vilvens, 2009 (SALOMON 2)
◘ *C. aporia* Vilvens, 2009 (SALOMONBOA 3)
○ *C. suduirauti* Bozzetti, 1997 (SALOMONBOA 3)
⊡ *C. polysarkon* n. sp. (BOA 1)

Regarding the description methodology, the main conchological features used are (see Fig. 1 below):

- general shape of the shell (spire high spired or depressed – conical, cyrtoconoidal, coeloconoidal);
- size and shape of the protoconch;
- shape of the whorls (convex, concave, straight - with or without shoulder or keel);
- spiral cords of the whorls (ontogeny, number, beaded or smooth, distance between cords);
- shape of the aperture, features of the outer and the inner lip;
- shape of the base and spiral cords : number, beaded or smooth, distance between cords;
- features of the umbilicus : open or covered with a callus, relative size, spiral cords around or inside umbilicus;
- columella : thickened or not;
- colour of the protoconch, of the whorls, of the base.

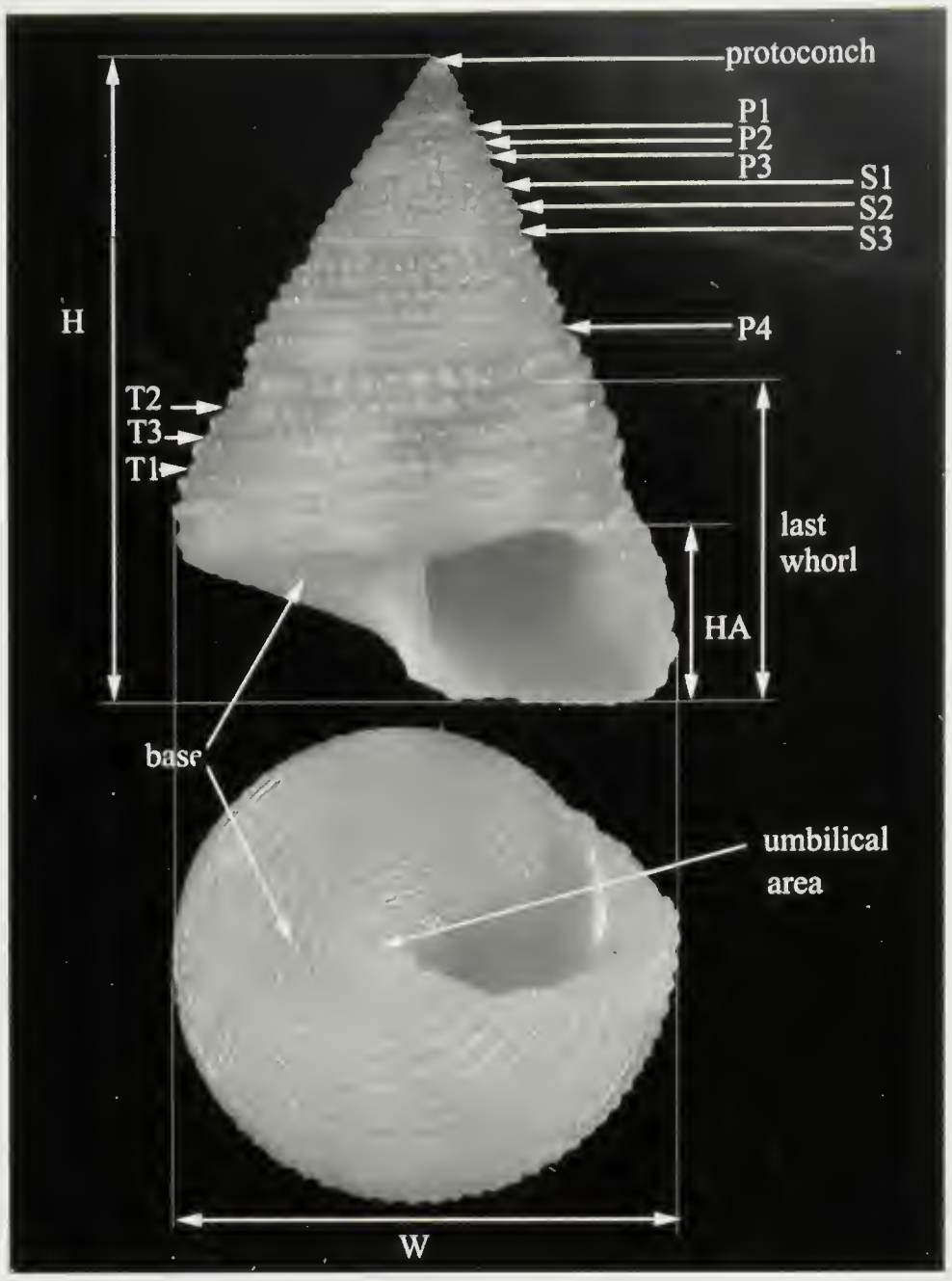


Figure 1. Features of Calliostomatidae shells; H : height; W : width; HA : height of the aperture; P1, P2, P3, ... : primary cords; S1, S2, S3, ... : secondary cords; T1, T2, ... : tertiary cords (shell : *Calliostoma (Fautor) chlorum* Vilvens, 2005, Fiji, BORDAU 1, stn DW1454, 13.6 x 10.4 mm).

Abbreviations

Repositories
IMT: Institute of Malacology of Tokyo, Tokyo, Japan.
MNHN: Muséum national d'Histoire naturelle, Paris, France.

Other abbreviations (see Fig. 1 above)

H: height.
W: width.
HA: height of the aperture.
TW: number of teleoconch whorls.
P1, P2, P3, ...: primary cords (P1 is the most adapical).
Pi: generic name for the primary cords (i=1,2,3, ...).
S1, S2, S3, ...: secondary cords (S1 is the most adapical).
Si: generic name for the secondary cords (i=1,2,3, ...).
T1, T2, T3, ...: tertiary cords (numbered following appearing order).
stn: station.
lv: live-taken specimens present in sample.
dd: no live-taken specimens present in sample.
sub: subadult specimen.
juv: juvenile specimen.

SYSTEMATICS

We follow here Marshall (1995), Bouchet & Rocroi (2005) and Williams et al. (2008, 2010) where Calliostomatidae, earlier treated as a subfamily of Trochidae (Hickman & McLean, 1990), are now ranked as a family of superfamily Trochoidea, with the two subfamilies Calliostomatinae and Thysanodontinae.
Regarding subgenera of the genus *Calliostoma*, we decide to not use them here, because they seem today rather artificial considering the information brought by DNA studies. One can however refer to Marshall (1995) regarding Indo-Pacific subgenera.

Superfamily **TROCHOIDEA** Rafinesque, 1815
Family **CALLIOSTOMATIDAE** Thiele, 1924
Subfamily **CALLIOSTOMATINAE** Thiele, 1924
Tribe **Calliostomatini** Thiele, 1924 [= Ziziphininae Gray, 1847]
Genus ***Calliostoma*** Swainson, 1840
Type species *Trochus conulus* Linnaeus, 1758 (by s.d. Herrmannsen, 1846) – Recent, Mediterranean Sea.

Calliostoma arx Vilvens, 2005
Figs 30-31

Calliostoma (Benthastelena) arx Vilvens, 2005: 14-16, figs 41-44. Type locality: Tonga Islands, south of Eua Island, 483-531 m.

Material examined. Tonga Islands. BORDAU 2: stn CP1644, 21°05'S, 175°23'W, 501 m, 1 dd.

Distribution. Tonga, 483-531 m (dead); Fiji, 450-500 m (dead).

Remarks. The main characteristics of this species are:
– height up to 18 mm, width up to 16 mm;
– coeloconidal in shape, slightly higher than wide; angulate periphery;
– protoconch about 350 μm wide, of 1.25 whorl;
– teleoconch with up to 8.5 convex whorls with spiny spiral cords; P2 and P3 appearing first while P1 appears a quarter of whorl later; P4 slightly emerging from suture on fourth whorl; S4 and S1 appearing on sixth whorl, S2 on seventh whorl, S3 absent;
– weakly convex base with 12 rather thin granular spiral cords;
– narrow and deep umbilicus;
– cream white.

Calliostoma haapaiensis n. sp.
Figs 2-4

Type material. Holotype (14.1 x 11.5 mm) MNHN (IM-2000-27238).

Type locality. Tonga Islands, north of Ha'apai group, BORDAU 2, stn DW1595, 19°03'S, 174°19'W, 523-806 m.

Distribution. Tonga Islands, 523-806 m (dead).

Diagnosis. A *Calliostoma* species of medium size with a conical spire, concave whorls with up to 14 granular, close spiral cords, the two most abapical cords being the strongest and making a keel, a weakly convex base with up to 20 granular spiral cords, an umbilicus partly closed by the columella, an off white colour with irregular brownish orange flames and a peripheral cord alternating white and brown segments.

Description. *Shell* of medium size for the genus (height up to 14.1 mm, width up to 11.5 mm), higher than wide, conical to weakly coeloconoidal in shape; spire elevated, height 1.2x width, 4.1x aperture height; angulate periphery; umbilicate.
Protoconch about 300 μm wide, of 1.25 whorl, rounded, covered by a network of ridges producing large polygonal areas; thin, poorly visible terminal varix.
Teleoconch of 8.5 whorls, early whorls flat, next ones concave. Suture very poorly visible, not canaliculate.
First whorl moderately convex, sculptured by rather thick, almost orthocline ribs and 3 spiral cords; P2 and P3 appearing immediately, P1 appearing a quarter of whorl later; P3 stronger and P1 weaker than other cords; distance between cords about 3x width of cords; distance between ribs 4x width of ribs; axial ribs making the cords granular. Second whorl only weakly convex to almost flat; all cords stronger, with thick beads; P3 very stronger than other cords, with pointed beads; distance between P1 and P2 similar in size to cords, distance between P2 and P3 about 2x width of P2; axial ribs prosocline; suture poorly visible. Third whorl flat with P3 much stronger with sharp beads, producing keel; P1 weaker than P3, but stronger than P2; S2 appearing, very thin; P4 partly visible, almost completely hidden by succeeding whorl; axial ribs still strong, distance between similar in size to width of ribs. On fourth whorl, S1 appearing; S2 similar in size to P2; T1 appearing between P2 and S2; P4 almost fully visible; beads of P3 thick, bluntly pointed; axial ribs between P2 and P3 thicker than other cords; whorl slightly concave in shape, with a basal keel made by P3. On fifth whorl, beads of P1 axially elongated; all cords similar in size except P1 stronger and P3 much stronger; axial ribs weaker, reduced to thin threads; whorl strongly concave between suture and P3; P3 and P4 making a strong peripheral keel. On sixth whorl, T2 appearing between S2 and P3, quickly as strong as S2; axial threads no more visible. On last whorls, additional thin, smooth cords appearing elsewhere between P1 and P3, number of cords reaching about 14; angular periphery.
Aperture subquadrangular; outer lip thin, curved, with a basal part rounded, meeting inner lip with rounded angle. Columella oblique, almost straight, without tooth.
Base weakly convex, with about 20 spiral cords; outer cords very thin, subgranular; cords thickening towards umbilicus and becoming granular, innermost cords twice thicker than outermost cords; fine axial threads on the whole surface.
Umbilicus narrow (about 7% of shell width), funnel shaped with gentle slope, half covered by an expansion of columella.
Colour of teleoconch globally off white, with brownish orange flames; P3 with regular brown patches covering two or three beads and separated by four or five whitish coloured beads; base nacreous pinkish white; protoconch white translucent.

Discussion. *Calliostoma haapaieusis* n. sp. is rather close to *C. heros* Marshall, 1995 from Loyalty Islands (Figs 5-7), but this similar in size and in spiral cords ontogeny species has a smaller H/W ratio for specimens of the same size, a protoconch with a strong terminal varix, only weakly (not strongly) concave whorls with a very much less prominent peripheral keel, thicker spiral cords on whorls and base, thicker and not similar in size beads on P3.
The new species is close to *C. katoi* Sakurai, 1994 from Japan (Figs 8-9) but this similar in size species has an umbilicus, has less numerous, thicker spiral cords on the whorls and only 6-7 smooth spiral cords on the base.

Etymology. From the type locality, Ha'apai islands, one of the three islands groups of Tonga archipelago.

Calliostoma vaubanoides n. sp.
Figs 14-16

Type material. Holotype (14.8 x 15.3 mm) MNHN (IM-2000-27239).

Type locality. Tonga Islands, south of Nomuka group, BORDAU 2, stn DW1548, 20°38'S, 175°03'W, 476-478 m.

Distribution. Tonga Islands, 476-478 m (dead).

Diagnosis. A *Calliostoma* species of medium size with a coeloconoidal spire, flat whorls with up to 9 granular spiral cords, the peripheral cords being the strongest and making a weak keel, an almost flat base with up to 14 granular spiral cords, no umbilicus, an orange colour with brow flames on the adapical area of the whorls and on the base.

Description. *Shell* of medium size for the genus (height up to 14.8 mm, width up to 15.3 mm), wider than high, coeloconoidal in shape; spire moderately elevated, height 0.97x width, 3.0x aperture height; angulate periphery; anomphalous.
Protoconch about 350 μm wide, of 1.25 whorl, rounded, covered by a network of ridges producing large polygonal areas; thin terminal varix.
Teleoconch of 7.0 whorls, all almost flat except the two last whorls weakly convex.
Suture visible, not canaliculate.
First whorl moderately convex, sculptured by prosocline ribs and 3 spiral cords; P2 and P3 appearing immediately, P1 appearing about a quarter of whorl later; P4 completely hidden by succeeding whorl; P1 slightly weaker than other cords; distance between cords about 2x width of cords; distance between ribs 1.5x width of ribs; axial ribs making the cords granular. Second whorl only weakly convex to almost flat; all cords stronger and similar in size, with thick beads; axial ribs similar in thickness to the cords, giving a reticulate pattern. Third whorl flat in shape; P2 weaker than other cords, P3 the strongest with weakly pointed beads; S2 appearing at mid whorl, very thin; S1 appearing at end of whorl, also very thin. On fourth whorl, S3 appearing; S1 and S2 still much thinner than Pi; P1 and P3 stronger than all other cords, P3 the strongest with bluntly pointed beads, making a weak keel; axial threads weakening. On fifth whorl, axial threads disappearing; all cords similar in size except P1 stronger and P3 the strongest. On sixth whorl, T1 appearing between P1 and S1 and T2 between S1 and P2; P4 partially emerging from suture; beads of all the cords pointed. On last whorl, S2, P3 and S3 stronger than other cords; P4 very weaker than other cords; angular periphery.
Aperture subtriangular; outer lip rather thin, slightly curved, with a basal part almost straight, meeting inner lip with a distinct angle. Columella vertical, slightly curved, without tooth.
Base very weakly convex to almost flat, with 14 spiral cords; innermost cords slightly thicker than outermost, all granular; interspaces between cords as wide as cords. No umbilicus.
Colour of two first teleoconch whorls off white, other whorls orange with brow flames on the adapical area; base off white to light orange, with axial brown flames; protoconch off white.

Discussion. *Calliostoma vaubanoides* n. sp. is close to *Calliostoma vaubani* Marshall, 1995 from Northern New Caledonia (Figs 10-11), but the latter species is smaller for a similar number of whorls, is higher than wide, has a larger protoconch (400-430 μm) and has a different spiral cords ontogeny with S1 appearing much more later,
The new species looks also a little like *Calliostoma monikae* Stratmann & Schwabe, 2007 from Samoa Islands, but the latter species is smaller (height up to 8.5 mm) for a similar number of whorls, is higher than wide with a strictly conical shape and an oblique, thickened columella.

Etymology. Similar in shape (Greek suffix: -οιδης) - from the closest *Calliostoma* species, *C. vaubani* Marshall, 1995.

Calliostoma mesemorinon n. sp.
Figs 17-19, Table 1

Type material. Holotype (13.3 x 10.6 mm) MNHN (IM-2000-27240). Paratypes 2 MNHN (IM-2000-27241).

Type locality. French Polynesia, Austral Archipelago, eastern coast of Rurutu, BENTHAUS, stn CAS2008, 22°27'S, 151°19'W, 280-300 m.

Material examined. Austral Archipelago. BENTHAUS: stn CAS2008, 22°27'S, 151°19'W, 280-300 m, 4 dd (holotype and 2 paratypes).

Distribution. French Polynesia, Austral Archipelago, 280-300 m (dead).

Diagnosis. A *Calliostoma* species of medium size, with a conical spire, up to 5 strongly granular, close spiral cords, the most adapical cord finally the strongest, an almost flat base with up to 9 strong granular spiral cords; no umbilicus; nacreous white.

Description. *Shell* of medium size for the genus (height up to 13.3 mm, width up to 10.6 mm), higher than wide, conical in shape; spire elevated, height 1.2 x to 1.3 x width, 3.2x to 4.0x aperture height; angulate periphery; anomphalous.
Protoconch about 260-270 μm wide, of 1 whorl, rounded, covered by a network of ridges producing polygonal areas; rather strong terminal varix.
Teleoconch of up to 8.5 more or less flat whorls. Suture very poorly visible, not canaliculate.
First whorl convex, sculptured by thick axial, orthocline ribs and 3 spiral cords appearing almost simultaneously; P1 weaker than P2 and P3; distance between cords similar in size to cords; axial ribs making the cords granular; distance between ribs 1.5 times larger than width of ribs. Second whorl flat; P2 and P3 much stronger with thick sharp beads. On third whorl, P4 partly visible, almost completely hidden by succeeding whorl; axial ribs weaker, prosocline, distance between ribs 2 times larger than width of ribs; S2 appearing near end of whorl; S1 and S3 absent. On fourth whorl, beads of P3 pointed; axial ribs vanishing. On fifth whorl, P1 slightly weaker than P3, stronger than P2 and S2; no axial ribs still visible. On next whorls, all cords similar in strength; beads of cords axially elongated. On last whorl, P4 visible, P3 peripheral; P1 dividing into two cords, the most adapical slightly thicker; distance between cords much smaller than cords; angular periphery.
Aperture subquadrangular; outer lip rather thin at rim, thickened within, with a weak angle and an almost straight basal part, meeting inner lip with obtuse angle; inner lip thickened in its adapical part. Columella slightly oblique, curved in its abapical part. Base almost flat, with 8-9 strong, granular spiral cords; beads subrectangular; distance between cord similar to thickness of cords; innermost cords slightly thicker. Umbilicus closed by an expansion of the columella.
Colour of teleoconch nacreous white with pinkish shade; protoconch white.

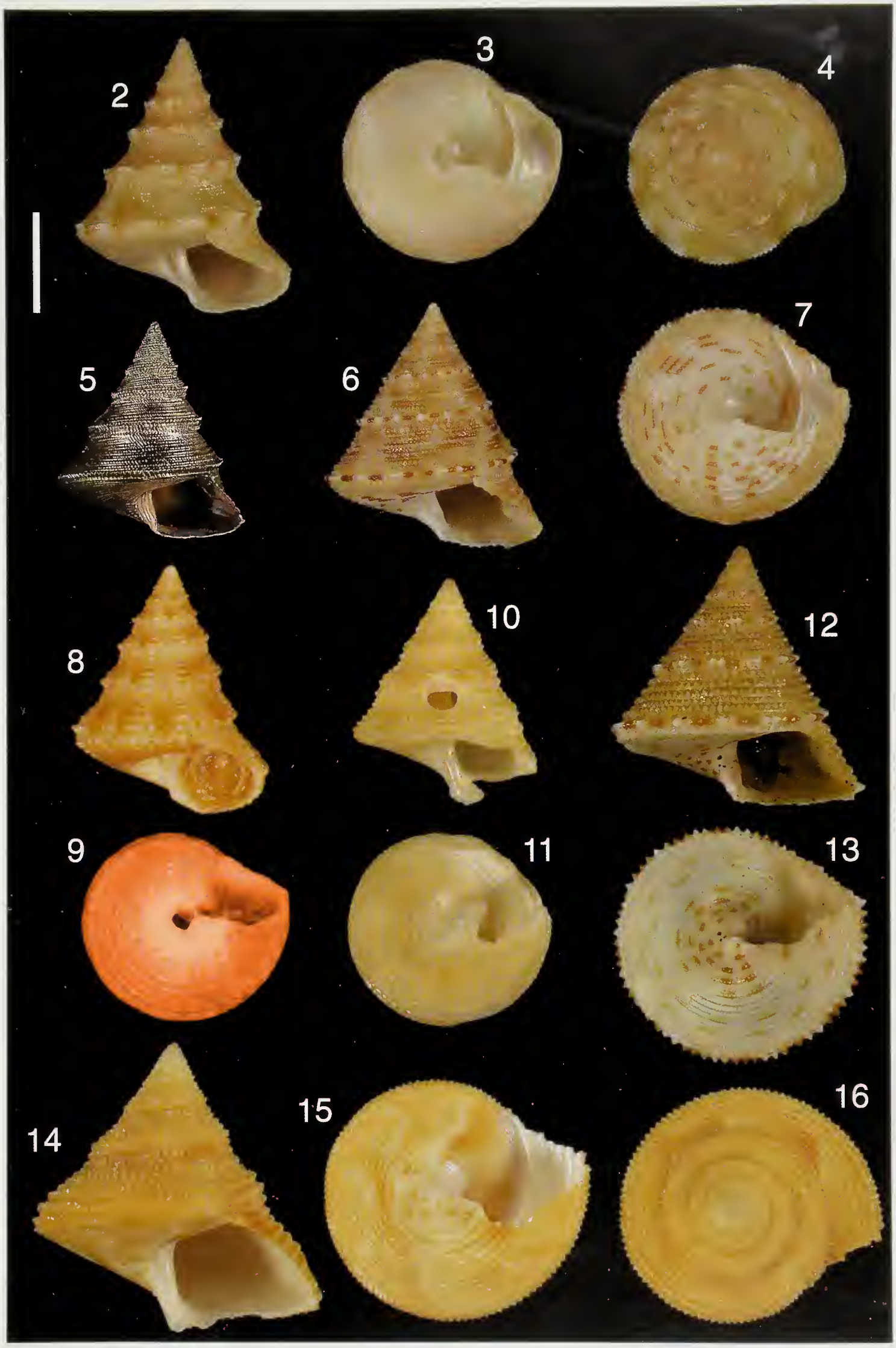
	TW	H	W	HA	H/W	H/HA
holotype	7.8	13.3	10.6	3.6	1.25	3.69
paratype 1	7.7	12.5	10.2	3.1	1.23	4.03
paratype 2	7.0	12.0	9.5	3.7	1.26	3.24

Table 1. *Calliostoma mesemorinon* n. sp.: Shells measurements in mm for types (TW and H estimated for paratype 2).

Discussion. *Calliostoma mesemorinon* n. sp. is rather close to *Calliostoma lepton* Vilvens, 2012 from Tuamotu Archipelago (Figs. 20-21), but this similar in size species has a different shape (coeloconoidal in shape in upper part and cyrtoconoidal in lower part with a subangular periphery), spiral cords S1 and S4 with tertiary cords and a moderately convex base.

Figures 2-16 (scale bar: 5 mm)

2-4. *Calliostoma haapaiensis* n. sp., holotype MNHN (IM-2000-27238), Tonga Islands, 523-806 m [BORDAU 2, stn DW1595], 14.1 x 11.5 mm.
5-7. *Calliostoma heros* Marshall, 1995, Loyalty Ridge. **5.** Holotype MNHN (MNHN 27159], 375 m [MUSORSTOM 6, stn DW482], 11.4 x 10.0 mm (gilded for SEM); **6-7.** Paratype MNHN (MNHN 27161), 255 m [SMIB 5, stn DW93], 13.0 x 11.4 mm.
8-9. *Calliostoma katoi* Sakurai, 1994, holotype NSMT (ex collection Sakurai), Japan, Kochi prefecture, Okinoshima Islet, 13.1x11.2 mm.
10-11. *Calliostoma vaubani* Marshall, 1995, paratype MNHN, New Caledonia, 415-460 m [LAGON, stn 475], 11.4 x 9.1 mm.
12-13. *Calliostoma suduirauti* Bozzetti, 1997, Solomon Islands, 134-272 m [SALOMONBOA 3, stn DW2827], 13.3 x 10.6 mm.
14-16. *Calliostoma vaubanoides* n.sp., holotype MNHN (IM-2000-27239),Tonga Islands, 476-478 m [BORDAU 2, stn DW1548], 14.8 x 15.3 mm.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The new species resemble *Calliostoma takujii* Kosuge, 1986 from Japan (Figs. 22-23), but this slightly smaller species has a less elevated spire, a spiral cord S3, a distance between spiral cords of the last whorl similar in size to cords and adapical cords much stronger than abapical ones.
Calliostoma mesemorinon n. sp. may be compared to *C. strobilos* Vilvens, 2005 from Fiji (Figs. 24-25), but this more or less similar in size species has a different spiral cords ontogeny, with S1 and S3 cords presents, and more numerous, thinner spiral cords on the base.

Etymology. Southern, from the South (Greek: μησεμορινοζ, η, ον) – with reference to the geographic area of the type locality.

Calliostoma paradigmatum Marshall, 1995
Figs 26-27

Calliostoma (Fautor) paradigmatum Marshall, 1995b: 395-397, figs 13-15, 119, 155. Type locality: Southern New Caledonia, 505-550 m.
Calliostoma (Fautor) paradigmatum – Vilvens, 2005: 2.
Calliostoma (Fautor) paradigmatum – Vilvens, 2009a: 132, figs 25-26.
Calliostoma (Fautor) paradigmatum – Vilvens, 2012: 18, figs 51-54.

Material examined. Austral Archipelago. BENTHAUS: stn DW1884, 27°54'S, 143°33'W, 570-620 m, 1 dd.

Distribution. Off Ile Surprise, northern New Caledonia, 585 m (living); South of Ile des Pins, southern New Caledonia, northern Norfolk Ridge, 470-795 m, living at 550-795 m (range computed using data of Marshall, 1995); Tonga, 342-500 m (dead); Tarava Seamounts, 660-670 m (dead); Austral Archipelago, 570-620 m (dead).

Remarks. The main characteristics of this species are:
– height up to 14 mm, width up to 11.5 mm;
– conical in shape, higher than wide; rounded periphery;
– protoconch about 400-430 μm wide, of 1.25 whorl;
– teleoconch with up to 7.6 slightly convex whorls; Pi (i=2,3,4) appearing on first whorl, P1 on second whorl, S2 on third whorl, S1 on fourth whorl, S3 on sixth whorl; P4 visible on last whorl;
– weakly convex base with 12-17 granular spiral cords;
– no umbilicus;
– white.

The fact that there is a huge gap between the type locality (southern New Caledonia) and the large area from Tonga Islands to French Polynesia was already pointed out (Vilvens, 2005; Vilvens, 2012). This sample from Austral Archipelago is slightly taller than the New Caledonian samples but confirms that the Polynesian samples have a spiral cord P4 emerging later, a spiral cord S3 absent (but this can happen, *fide* original description) and a smaller protoconch (about 250-300 μm for the Polynesian specimens).

Calliostoma hexalyssion Vilvens, 2009
Figs 32-33

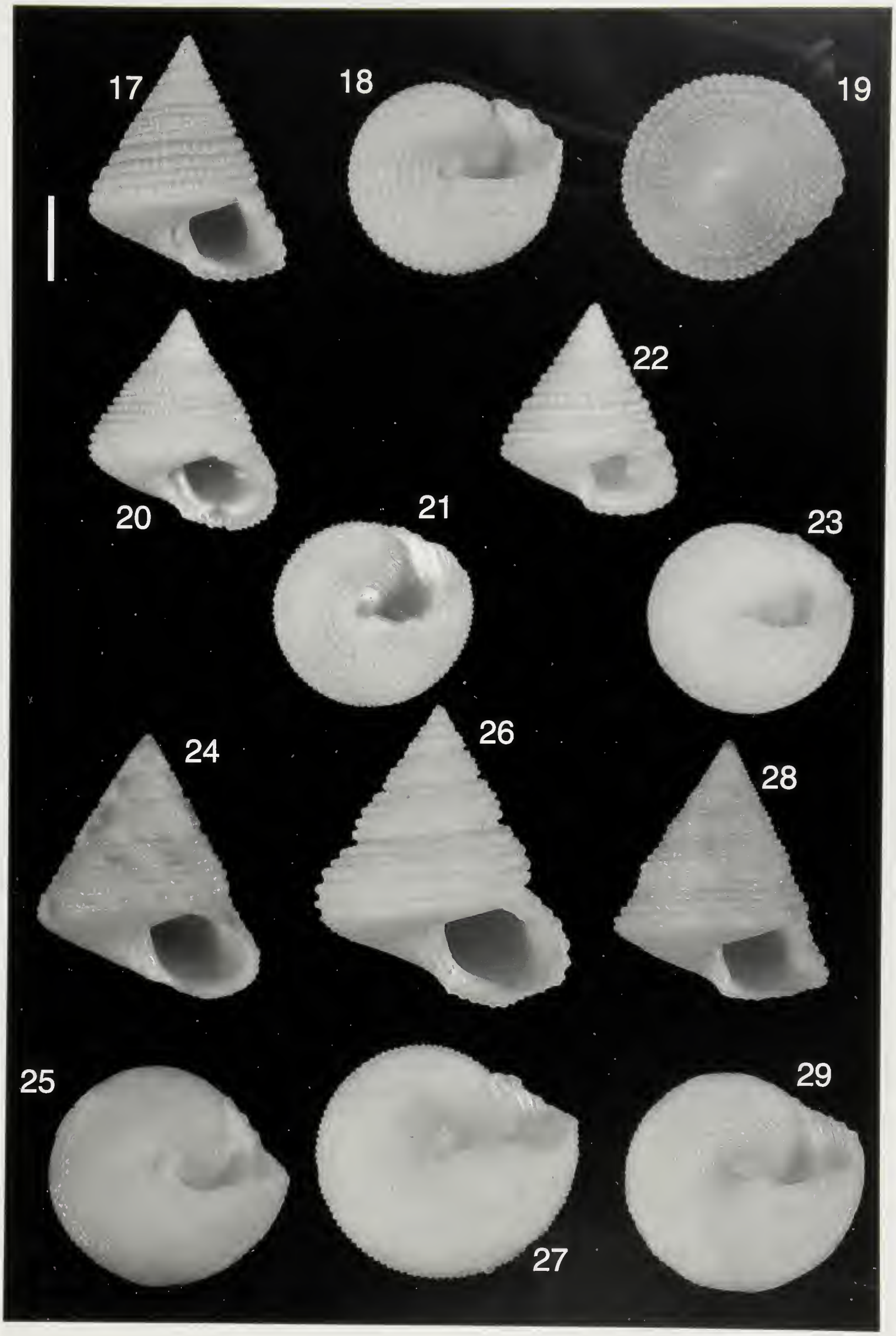
Calliostoma (Benthastelena) hexalyssion Vilvens, 2009B: 142-146, figs A1-A2, 73-78. Type locality: Solomon Islands, Vella Gulf, 460 487 m.

Material examined. Solomon Islands. SALOMON 2: stn CP2268, 07°49'S, 156°53'E, 632-640 m, 1 dd. – SALOMONBOA 3: stn CP2850, 09°37'S, 160°47'E, 502-621 m, 1 dd, 1 dd sub. – Stn CP2803, 09°14'S, 160°20'E, 150-160 m, 2 dd sub.

Distribution. Solomon Islands, 150-728 m, living at 397-650 m.

Figures 17-29 (scale bar: 5 mm)

17-19. *Calliostoma mesemorinon* n. sp., holotype (MNHN IM-2000-27240) Australes Archipelago, 280-300 m [BENTHAUS, stn CAS2008], 13.3 x 10.6 mm.
20-21. *Calliostoma lepton* Vilvens, 2012, holotype (MNHN 24976), Tuamotu Archipelago, 315-340 m [TARASOC, stn DW3370], 12.6 x 10.8 mm.
22-23. *Calliostoma takujii* Kosuge, 1986, holotype IMT (IMT-86-1), Japan, Ogasawara (Bonin) Islands, 12.0 x 9.7 mm.
24-25. *Calliostoma strobilos* Vilvens, 2005, holotype (MNHN 4560), Fiji, 300-450 m [BORDAU 1, stn DW1455], 14.4 x 11.9 mm.
26-27. *Calliostoma paradigmatum* Marshall, 1995, Australes Archipelago, 570-620 m [BENTHAUS, stn DW1884], 15.7 x 13.2.
28-29. *Calliostoma aporia* Vilvens, 2009, Solomon Islands, 320-330 m [SALOMONBOA 3, stn CP2859], 14.1 x 11.6 mm.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Remarks. The main characteristics of this species are:
– height up to 22 mm, width up to 18 mm;
– conical to weakly concave in shape, higher than wide; angulate periphery;
– protoconch about 350 μm wide, of 1 whorl;
– teleoconch with up to 9.1 nearly straight to weakly concave whorls; P2 and P3 appearing on first whorl, P1 half whorl later, S3 on third whorl, S1 and S2 on fourth whorl; P4 visible on last whorl;
– weakly convex base with up 12 spiral cords, with very low, very thin intermediate cords giving to this zone a smooth appearance;
– no umbilicus;
– pinkish white.

Calliostoma aporia Vilvens, 2009
Figs 28-29

Calliostoma (Ampullotrochus) aporia Vilvens, 2009B: 150-151, figs F1-F2, 107-110. Type locality: Solomon Islands, New Georgia Group, 105-128 m.

Material examined. Solomon Islands. SALOMONBOA 3: stn CP2859, 09°19'S, 160°19'E, 320-330 m, 7 dd, 2 dd juv.

Distribution. Solomon Islands, 128-330 m (dead).

Remarks. The main characteristics of this species are:
– height up to 11 mm, width up to 9 mm;
– conical in shape, higher than wide; angulate periphery;
– protoconch about 220 μm wide, of 1 whorl;
– teleoconch with up to 7.7 straight whorls; Pi (i=1, 2, 3) appearing on first whorl, S3 on second whorl, S1 on fourth whorl, S2 absent; P4 visible on last whorl;
– weakly convex base with up 10 granular spiral cords;
– no umbilicus;
– off-white to light grey.

Calliostoma suduirauti Bozzetti, 1997
Figs 12-13

Calliostoma suduirauti Bozzetti, 1997: 43, figs 1-4. Type locality: Philippines, Balicasag Island, 140 m.
Calliostoma suduirauti – Poppe, Tagaro and Dekker, 2006: 124, pl. 64, figs 5-6.

Material examined. Solomon Islands. North of San Cristobal, SALOMONBOA 3: stn DW2827, 10°26'S, 161°51'E, 134-272 m, 1 lv.

Distribution. Philippines, 50-150 m; Solomon Islands, 134-272 m.

Remarks. The main characteristics of this species are:
– height up to 15 mm, width up to 12 mm;
– coeloconidal in shape, higher than wide; angulate periphery;– teleoconch with up to 7 more or less flat whorls with beaded spiral cords; P2 and P3 appearing first while P1 appears half a whorl later; S2 appearing on third whorl, S1 on fourth or fifth whorl, S3 absent; P3 quickly thicker than other cords, with pointed beads; P4 visible on last whorl;
– weakly convex base with 9-10 beaded spiral cords;
– umbilicus closed;
– light brown with darker flames, suprasutural spiral cord alternating white and brown segments.

As it was noted for *C. paradigmatum* Marshall, 1995, one can wonder to find the Philippine *C. suduirauti* in Solomon Islands. But this SALOMONBOA shell shows all the main characteristics of this species, especially the same spiral cords ontogeny and similar colour. The only weak differences are a slightly less elevated spire and somewhat smaller beads on the spiral cords of the teleoconch whorls.

Calliostoma polysarkon n. sp.
Figs 34-36

Type material. Holotype (30.7 x 33.3 mm) MNHN (IM-2000-27242).

Type locality. Vanuatu, South-East of Malekula, BOA1, stn CP2467, 16°45'S, 167°59'E, 750-850 m.

Distribution. Vanuatu, 750-850 m (dead).

Diagnosis. A *Calliostoma* species of large size, with a globose shape, a moderately elevated spire, 4 strong, smooth spiral cords, one of them making shoulder at first third, a convex base with very weak smooth spiral cords, a rather wide umbilicus; light hazel with a beige base.

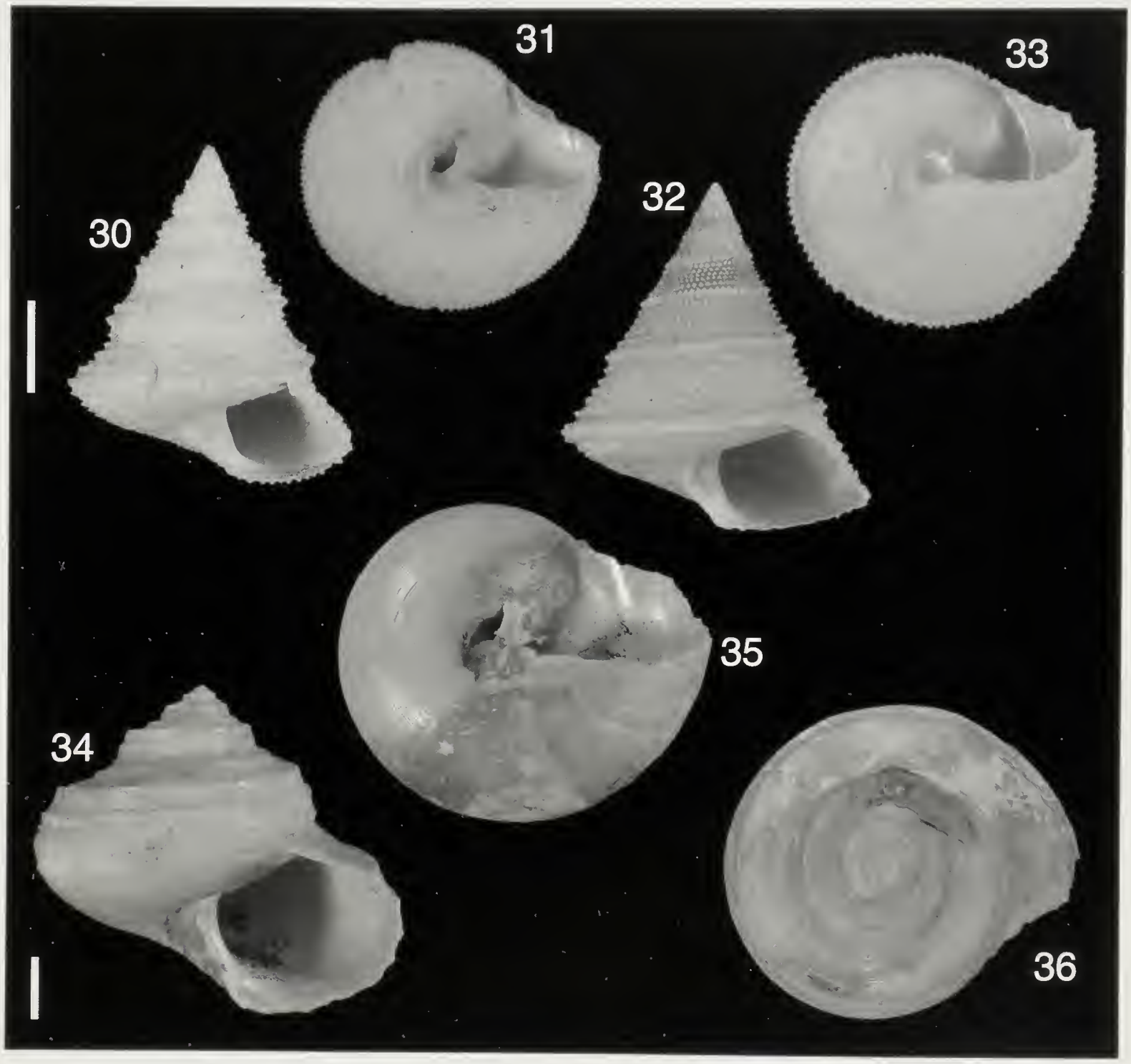
Description. *Shell* of great size for the genus (height 30.7 mm, width 33.3 mm), wider than high, globose in shape; spire moderately elevated, height 0.9x width, 1.7x aperture height; rounded periphery; rather wide umbilicus.
Protoconch about 350 μm wide, of 1.5 whorls, rounded, eroded.
Teleoconch of up to 6 convex whorls. Suture visible, not canaliculate.
First whorl convex, eroded, spiral cords poorly visible but indistinct at end of whorl. On second whorl, weak wide prosocline ribs and 4 subgranular spiral cords; P3 and P4 stronger than P1 and P2, P3 making weak shoulder; distance between cords similar in size to cords. On third whorl, P3 the strongest, making keel; P3 and P4 almost smooth; P3 making keel on shoulder; Si (i=1, 2, 3, 4) appearing, very thin, subgranular; P2 very weaker than other primaries; S4 poorly visible, almost completely hidden by succeeding whorl. On fourth whorl, axial ribs no more visible; P3 making stronger keel; P1 and P4 slightly weaker than P3, other cords much weaker; tertiary cords appearing everywhere on whorl. On fifth whorl,

S4 partly emerging from suture, stronger than P2 and other Si; secondary and tertiary cords of abapical half flat, rather wide; secondary and tertiary cords of adapical half rounded, thin, weak; distance between all cords smaller than cords. On last whorl, S4 fully visible; P3, P4 and S4 similar in strength, P1 slightly weaker; all other cords much weaker; rounded periphery.

Aperture subcircular; outer lip rather thin without any angle; inner lip thickened in its adapical part, making a basal flange. Columella almost vertical, slightly curved.

Base convex, with about 25 smooth spiral cords; outermost cord thick, smooth; other outer cords hard to distinguish, innermost cords more visible. Umbilicus rather wide (about 12% of total width), deep, funnel shaped umbilicus, partly covered by an expansion of the columella.

Colour of teleoconch whorls light hazel, base beige; protoconch white translucent.



Figures 30-36 (scale bars: 5 mm)

30-31. *Calliostoma arx* Vilvens, 2005, Tonga Islands, 501 m [BORDAU 2, stn CP1644], 21.1 x 17.2 mm.
32-33. *Calliostoma hexalyssion* Vilvens, 2009, Solomon Islands, 632-640 m [SALOMON 2, stn CP2268], 21.3 x 18.8 mm.
34-36. *Calliostoma polysarkon* n. sp., holotype (MNHN IM-2000-27242), Vanuatu, 750-850 m [BOA 1, stn CP2467], 30.7 x 33.3 mm.

Discussion. *Calliostoma polysarkon* n. sp. is rather close to *C. hajimeanum* Yoshida, 1948 from Japan, but this similar in size species has only 2 (not 4) main spiral cords, P4 (not P3) making keel on the shoulder and S4 peripheral, and much more numerous spiral cords (at least 50) on the base.

The new species may be compared to *Calliostoma nobile* (Hirase, 1922) from Japan, but this species has a less elevated spire, weaker main spiral cords and no shoulder on whorls, a nearly smooth base except some cords around the umbilicus and a wider umbilicus, without columellar projection on it.

Considering that *C. polysarkon* n. sp. looks a little like *Falsimargarita stephaniae* Rios & Simone, 2005 from Argentina (although this much smaller species is more depressed, has not the same main spiral cords on the whorls and less numerous, much stronger spiral cords on base), it could happen that the new species belong to the genus *Falsimargarita* Powell, 1951. Only soft part and radula studies of additional specimens might lead to use this genus for the new species.

Etymology. Stout, plump (Greek : πολυσαρχοζ, ον) – with reference to the very large and very convex last whorl of the shell.

ACKNOWLEDGEMENTS

I would like to thank P. Bouchet (Muséum national d'Histoire naturelle, Paris) for constructing advices and access to the malacological resources of the MNHN and V. Héros (MNHN) for her help in my search of various scientific papers.

I am also very grateful to H. Saito (National Museum of Nature and Science, Tokyo) for the loan of types from his institution.

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ERRATUM

In Vol. 15(1) of *Novapex* dated 10 March 2014 there was a mistake (inversion) in the plate captions for the figures 35-44 (page 8):

37-38. *Joculator itiensis* n. sp., Austral Is., holotype MNHN (n° Moll. 26472), 2 m, [stn 11, N Rapa Iti Is.], 1.95 x 0.85 mm, protoconch 0.25 x 0.18 mm

must be:

37-38. *Joculator bouteti* n. sp., Austral Is., holotype MNHN (n° Moll. 26470), 2 m, [stn 6, Rapa Is.], 1.67 x 0.77 mm, protoconch 0.22 x 0.19 mm

and

39-40. *Joculator bouteti* n. sp., Austral Is., holotype MNHN (n° Moll. 26470), 2 m, [stn 6, Rapa Is.], 1.67 x 0.77 mm, protoconch 0.22 x 0.19 mm

must be:

39-40. *Joculator itiensis* n. sp., Austral Is., holotype MNHN (n° Moll. 26472), 2 m, [stn 11, N Rapa Iti Is.], 1.95 x 0.85 mm, protoconch 0.25 x 0.18 mm.

REFERENCE

Cecalupo, A. & Perugia, I. Cerithiopsidae and Newtoniellidae (Gastropoda: Triphoroidea Gray) from French Polynesia area (South Pacific Ocean). *Novapex* 15(1): 1-22.

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Les auteurs devront suivre strictement les règles du *Code de Nomenclature Zoologique* (quatrième édition).
Manuscrits. Les manuscrits seront rédigés en français ou en anglais. Ils doivent être dactylographiés, justifiés à gauche, avec double interligne, sur une seule face de papier A4 et sur une colonne. Les marges doivent être de 25 mm minimum. La séquence des sections respectera l'ordre suivant : titre, nom de(s) auteur(s), adresse(s) de(s) auteur(s), mots-clés et résumé en anglais (et éventuellement en français). Les noms de genre et des (sous) espèces seront en caractères *italiques*. Les références dans le texte auront la forme: Keen & Campbell (1964) ou (Keen & Campbell, 1964). **Consultez un numéro récent de Novapex pour l'organisation du texte.**
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Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(I): 46-57.
Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells*. William Collins Publishers Ltd: xiv + 500 pp.
Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
Source Internet:
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NOVAPEX/SOCIETE

(suite)

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NOVAPEX / Société

Prochaines activités de la SBM

Claude VILVENS

Lieu de réunion : **A partir de 14h, à notre local habituel :**

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

SAMEDI 6 SEPTEMBRE 2014

Etienne MEULEMAN : Les familles "oubliées" ou "négligées"

Si tout le monde (ou presque) connait les Conidae ou les Muricidae, voire encore les Trochidae ou les Tellinidae, qui identifie réellement les Akeridae, Arbaciidae, Charopidae, Dyakiidae, Neilonellidae, Pickworthidae, …. Notre Vice-président se propose de pister ces familles peu connues et de nous en révéler une partie des secrets.

***

SAMEDI 27 SEPTEMBRE 2014

Tout le monde : L'excursion d'automne de la SBM.

Cette fois, direction la province de Namur : nous allons prospecter sur un site de cette belle région, bien connue pour sa richesse malacologique. Nous n'avons pas encore déterminé le site avec précision, car plusieurs zones sont éligibles : nos reconnaissances nous permettront sans doute de choisir la plus prometteuse.

Comme d'habitude, les informations fraiches seront disponibles sur notre site Internet (**http://www.societe-belge-de-malacologie.be/ → Réunions**). Comme d'habitude aussi, il convient de prévoir d'emporter sa bonne humeur, un guide de détermination (j'en connais des pas mal ;-)) … et sans doute aussi bottes et vêtements de pluie (en principe, il fera encore doux et ensoleillé, mais bon, on ne sait jamais ;-) …).

***

SAMEDI 11 OCTOBRE 2014

Tout le monde : L'EXPOSITION ANNUELLE DE LA SBM.

Eh oui, voici revenu le rendez-vous quasi-rituel de l'exposition de coquillages par les membres de la Société. Nous occuperons l'une des deux salles **Memling** ou **Brueghel** au même étage de notre adresse habituelle de réunion, selon les disponibilités (voir à nouveau sur notre site Internet).

Cette exposition est l'occasion pour chacun de montrer l'un ou l'autre aspect de la malacologie qui lui tient à cœur. Aucune condition particulière n'est requise et tout le monde est cordialement invité à participer et aussi, bien sûr, à venir admirer quelques spécimens qui font la fierté de la collection de nos membres ! En particulier, **pourquoi ne pas inviter quelques-uns de vos amis à venir découvrir notre passion** ?

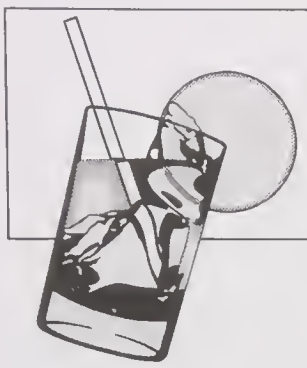
-- ***PUIS :*** La tradition du banquet sera aussi respectée en tant qu'événement gastronomique attendu : nous vous proposons en effet de nous retrouver au traditionnel **banquet annuel de la SBM** qui débutera à 19h (voir annonce ci-dessous)

*Réservez déjà dans vos agendas le **8/11/2014** et le **13/12/2014**.*

Pour les informations de dernière minute :

Sur Internet :

http://www.societe-belge-de-malacologie.be/

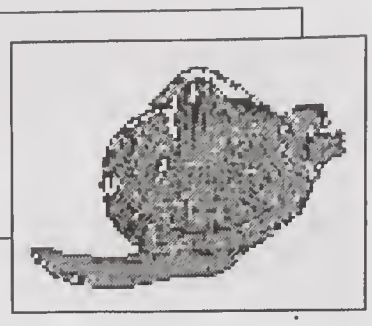


Banquet de la Société Belge de Malacologie

le samedi 11 octobre 2014 à 19h

au restaurant :

Le Phénix



Rue de Genève, 480 - 1030 Bruxelles

- donc juste à côté de la salle de réunion ! -

Nous vous emmenons à deux pas du lieu de réunion, au restaurant Le Phénix, lequel nous propose :

- Apéritif maison OU Kir royal
- **Scampis Phénix** OU **toast aux champignons** des bois
- **Pavé de bœuf**, sauce au choix OU **roulades de sole** à l'ostendaise
- Tiramisu
- Café
- Une demi bouteille de vin par personne

Prix : 34,00 €

Extra à payer individuellement en supplément.

Il est impératif de réserver afin que le restaurateur puisse nous réserver le meilleur accueil

Comment réserver ?

Pour le 1er octobre 2014 au plus tard, il convient de virer la somme correspondant au nombre de menus réservés au compte BNP PARIBAS FORTIS - BIC GEBABEBB / IBAN **BE88 2100 2622 7741**
de **Roland Scaillet**, Avenue Franz Guillaume, 63 – 1140, Bruxelles.

SVP : ne pas effectuer de versement à la S.B.M. !

Afin de préparer au mieux cette soirée, après avoir effectué votre réservation et paiement, **veuillez communiquer votre choix de plats dans le menu à** scaillet.roland@skynet.be.

Nous nous réjouissons de vous rencontrer lors de cette joyeuse activité !

Bonnes vacances à tous !!!

Novapex/Société : la publication généraliste de la SBM

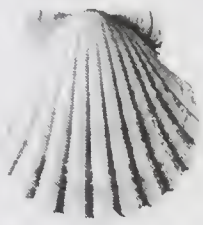
Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

Afin de faciliter le travail de la Rédaction, il est vivement (et le mot est faible ;-)) souhaité de respecter les règles suivantes pour les articles proposés :

- document MS-Word (pour PC Windows XP ou 7);
- police de caractères Times New Roman;
- texte de taille 10, titres de taille 12;
- interligne simple;
- toutes les marges à 2,5 cm;
- document en une seule section;
- pas de mode colonne;
- photos en version électronique JPG ou PNG.

Merci pour les Scribes ;-) ! N'hésitez pas à demander une page avec en-tête pour cadrer au mieux vos travaux (vilvens.claude@skynet.be ou e.meuleman@skynet.be).



Hexaplex saharicus saharicus (Locard, 1897), distribution et illustrations des variations intra-spécifiques

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MOTS CLEFS *Hexaplex saharicus saharicus* - Muricidae - Maroc atlantique

KEY WORDS *Hexaplex saharicus saharicus* - Muricidae - Atlantic Morocco

RESUMÉ

De nombreux exemplaires d'*Hexaplex saharicus saharicus* (Locard, 1897) ont été récoltés à Asilah, nord du Maroc Atlantique. La distribution de l'espèce est discutée et les variations intra-spécifiques sont illustrées.

ABSTRACT

Numerous specimens of *Hexaplex saharicus saharicus* (Locard, 1897) were collected at Asilah on the Northern Moroccan Atlantic coast. The distribution of the species is discussed and the intra-specific variations are illustrated.

INTRODUCTION

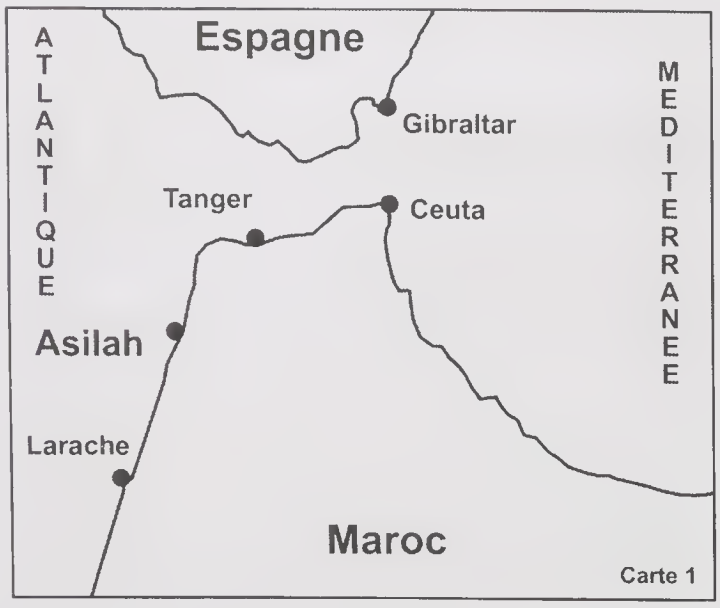
Hexaplex saharicus saharicus (Locard, 1897) est un Muricidae de taille moyenne pouvant atteindre une hauteur d'environ 100 mm. Le matériel type de Locard conservé au MNHN est composé d'individus juvéniles : lectotype 28,6 mm et le plus grand des deux paralectotypes 29,5 mm (Houart 1996), l'un d'eux est illustré ici (Fig. 20). La coquille est formée de 6 à 7 tours convexes séparés par une suture ondulée marquée. La protoconque d'environ deux tours est lisse (Fig. 13) et terminée par une varice axiale marquée (Fig. 14). Le dernier tour de téléoconque occupe environ les trois-quarts de la hauteur totale de la coquille. Le bord latéral opposé au labre est bien arrondi et se termine par un canal siphonal large, à ouverture étroite, légèrement oblique, d'abord rectiligne puis sur la fin sensiblement recourbé vers l'arrière. Sur le dernier tour, 5 varices axiales fortement épineuses alternent de façon régulière avec des côtes axiales arrondies délimitant entre elles des espaces intercostaux sensiblement égaux. La surface du test est parcourue de très nombreux cordons spiraux, irréguliers en épaisseur et couverts de lamelles imbriquées. Ils forment à la rencontre avec les varices des saillies épineuses, 5 principales particulièrement développées entre lesquelles alternent parfois d'autres moins marquées. Sur le labre, la saillie épineuse carénale porte l'épine la plus forte parfois très développée en longueur. La couleur de la coquille est brunâtre avec parfois des taches diffuses brun foncé sur la partie adapicale des tours.

Hexaplex saharicus saharicus vit entre 40 et 160 m de profondeur (Houart 1996 - Merle & *al.* 2011). Il est à remarquer qu'une des coquilles de Locard (1897) draguée par le Talisman en 1883 au Cap Blanc (Sahara Occidental) le fut par 1.493 m de fond. L'auteur ne mentionne pas si celle-ci était vivante ou vide. L'aire de distribution d'*Hexaplex saharicus saharicus* mentionnée dans la littérature s'étend du nord du Maroc (Larache) aux côtes du Sénégal (Houart 1996). Il est possible qu'elle s'étende jusqu'en Guinée, cependant la coquille provenant de cette région (Fig. 5) est considérée comme de provenance douteuse (Houart, 1993). Gregory (2009) mentionne avoir récolté deux spécimens d'*Hexaplex saharicus saharicus* dans le port d'Almeria (Espagne - Andalousie - Méditerranée).

Il existe une sous-espèce, *Hexaplex saharicus ryalli* Houart, 1993, localisée en Côte d'Ivoire et au Ghana. Elle diffère de l'espèce type par sa dimension plus petite (45 mm au lieu de 100 mm), par une protoconque portant des côtes axiales et se fondant progressivement avec la téléoconque sans montrer de varice à la jonction des deux zones, par un canal siphonal plus étroit, proportionnellement plus long et par les épines des varices, la première très longue et les 4 suivantes plus courtes, ouvertes et de quasi égale longueur.

Tenant compte de l'hiatus existant entre les aires de distribution des deux sous-espèces (Sénégal - Guinée (?) et Côte d'Ivoire), il se pourrait que *Hexaplex saharicus ryalli* Houart, 1993 puisse être considéré comme espèce à part entière.

RÉCOLTES PERSONNELLES



38 spécimens d'*Hexaplex saharicus saharicus* ont été récoltés en septembre 2013 dans les restes d'un nettoyage de filet à Asilah, petit port de pêche sur la côte atlantique du nord du Maroc (Carte 1). Les bateaux de pêche qui y travaillent sont de moyenne dimension et y pratiquent une pêche locale. Toutes les coquilles récoltées, à l'exception de 6 étaient vivantes et operculées. Le plus grand spécimen mesurait 64,9 mm x 46,2 mm et le plus petit 33,4 mm x 21.7 mm. 9 spécimens du lot et la protoconque de 2 autres sont illustrés dans la planche 2 (Figs 7 - 19)
Parmi les mollusques présents dans le résidu de nettoyage du filet, il y avait d'autres gastéropodes : *Xenophora crispa* (König, 1825) (2 spécimens vivants), *Ranella olearium* (Linnaeus, 1758) (1 spécimen vide), *Hexaplex trunculus* (Linnaeus, 1758) (1 spécimen vivant), *Ocenebra brevirobusta* Houart, 2000 (2 spécimens vivants) et *Ampulla priamus* (Gmelin, 1791) (1 spécimen vivant).
Les bivalves étaient représentés par *Anadara polii* (Mayer, 1868) (2 spécimens vides), *Aequipecten opercularis* (Linnaeus, 1758) (1 spécimen juvénile vivant) et une valve de *Lima lima* (Linnaeus, 1758). En outre, l'une des coquilles d'*Hexaplex saharicus saharicus* portait sur elle un spécimen vivant de *Neopycnodonte cochlear* (Poli, 1795). Aucune information n'a pu être récoltée sur place concernant la profondeur à laquelle ce matériel avait été prélevé. Néanmoins, l'énumération des espèces reprises ci-dessus est compatible avec une profondeur pouvant avoisiner les 80 à 100 mètres. Ce qui correspond à la bathymétrie rapportée dans la littérature pour les provenances d'*Hexaplex saharicus saharicus.*

DISCUSSION

La localité la plus septentrionale de récolte d'*Hexaplex saharicus saharicus* mentionnée par Houart (1993) était Larache quelques 45 Km au sud d'Asilah. Tenant compte du fait que la pêche pratiquée à Asilah est une pêche locale, on peut penser qu'il s'agit là de la limite supérieure actuellement connue pour la distribution de l'espèce. Quant à la limite sud, Houart (1993) mentionne le Sénégal et peut-être même la Guinée. Bien qu'il possède en collection un spécimen de cette dernière région (Fig. 5), il considère la localité comme douteuse.
Concernant les spécimens collectés par Gregory en 2009 dans le port d'Almeria, les données relatives à la récolte ne sont pas détaillées (type de chalutiers ? - pêche locale ou extra-méditerranéenne ? - Animaux récoltés morts ou vivant ?). Par ailleurs, les coquilles ne sont également pas représentées. N'ayant pu entrer en contact avec l'auteur pour éclaircir les zones d'ombre mentionnées, nous considérons temporairement cette provenance comme douteuse.

Neuf spécimens d'Asilah sont figurés dans la planche 2 (Figs 7 - 19), la taille et le nombre d'épines sur la varice labiale sont sujets à variations. A titre de comparaison, des exemplaires d'*Hexaplex saharicus saharicus* (Locard, 1897) de Larache (Maroc) (Fig. 1), du Sahara Occidental (Fig. 2), de Mauritanie (Fig. 3), du Sénégal (Fig. 4) et de Guinée (Fig. 5) sont illustrés dans la planche 1. On peut constater que les spécimens provenant du nord du Maroc (Larache et Asilah) sont plus petits et portent sur les varices des épines moins développées que ceux des régions plus méridionales.

CONCLUSION

L'aire de distribution de *Hexaplex saharicus saharicus* établie sur des provenances fiables s'étend donc du nord du Maroc (Asilah) jusqu'au Sénégal. Jusqu'à preuve du contraire, la signalisation en Méditerranée est non vérifiée et celle en Guinée est considérée comme douteuse.

REMERCIEMENTS

Pour la mise à disposition des spécimens d'*Hexaplex saharicus saharicus* provenant de différentes localités de la côte ouest-africaine, nous tenons à remercier l'aide apportée par Fernand De Donder et Roland Houart. Que ce dernier soit aussi remercié pour les remarques formulées lors de la relecture du manuscrit.

LÉGENDES

Planche 1 : Figs. 1 - 6. *Hexaplex saharicus saharicus* (Locard, 1897). : **(1)** Larache (Maroc) - Col. R. Houart - 51,4 x 33,7 mm. **(2)** Sahara Occidental - 150 m - Col. R. Houart - 78,5 x 68,3 mm. **(3)** Mauritanie - Col. R. Houart - 76,9 x 58,7 mm. **(4)** Large de Dakar (Sénégal) - Col. F. De Donder - 78,3 x 64,4 mm. **(5)** Guinée - Col. R. Houart - 84,5 x 65,4 mm. **(6)** Asilah (Maroc) - Col. Delongueville - 58,7 x 44,5 mm.

Planche 2 : Figs. 7 - 18. *Hexaplex saharicus saharicus* (Locard, 1897). - Asilah (Maroc) - Col. Delongueville & Scaillet. : **(7)** 60,3 x 45,7 mm. **(8)** 62,7 x 40,9 mm. **(9)** 60,3 x 43,6 mm. **(10 - 11)** 55,7 x 38,7 mm. **(12)** 44,4 x 28,4 mm. **(13)** 57,6 x 46,2 mm - détail de la protoconque. **(14)** 62,7 x 40,9 mm - détail de la protoconque. **(15)** 58,7 x 44,5 mm. **(16)** 50,2 x 36,3 mm. **(17 - 18)** 56,2 x 47,3 mm **(19)** 60,3 x 48,5 mm.

Fig. 20. : Extrait de la planche XV de Locard 1897 - Expéditions Scientifiques du Travailleur et du Talisman pendant les années 1880, 1881, 1882, 1883. Mollusques Testacés, Tome premier - *Murex saharicus* - Cap Blanc (Sahara).

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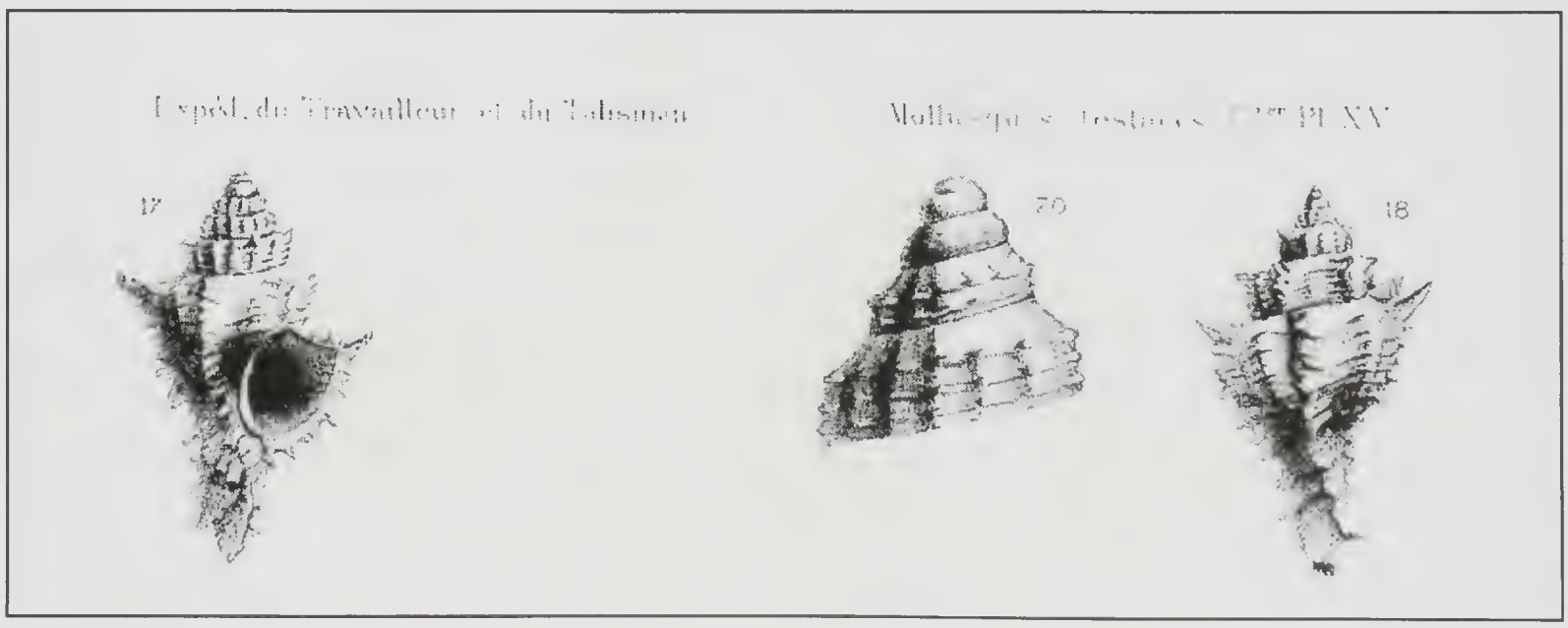
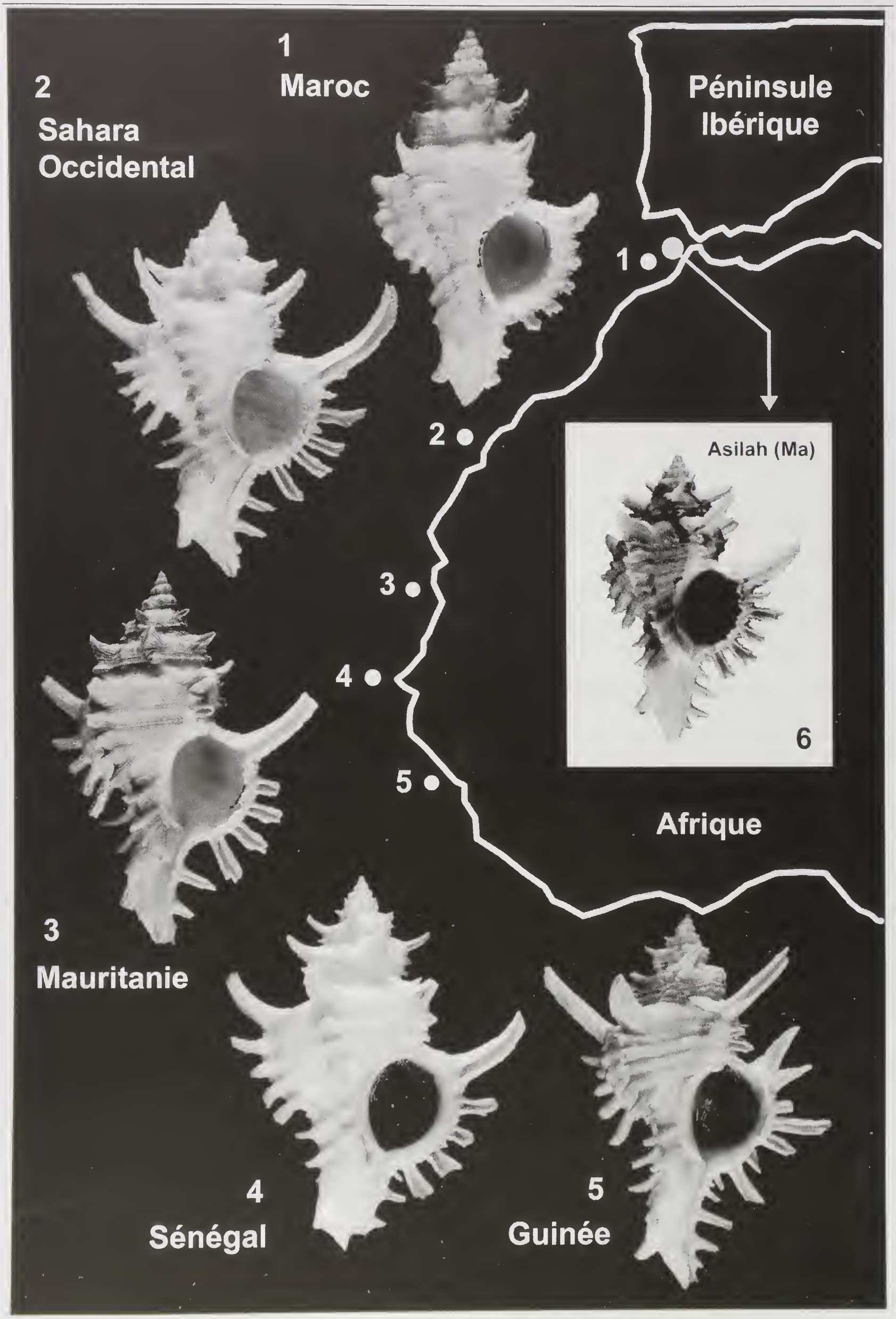


Fig. 20.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Sénégal
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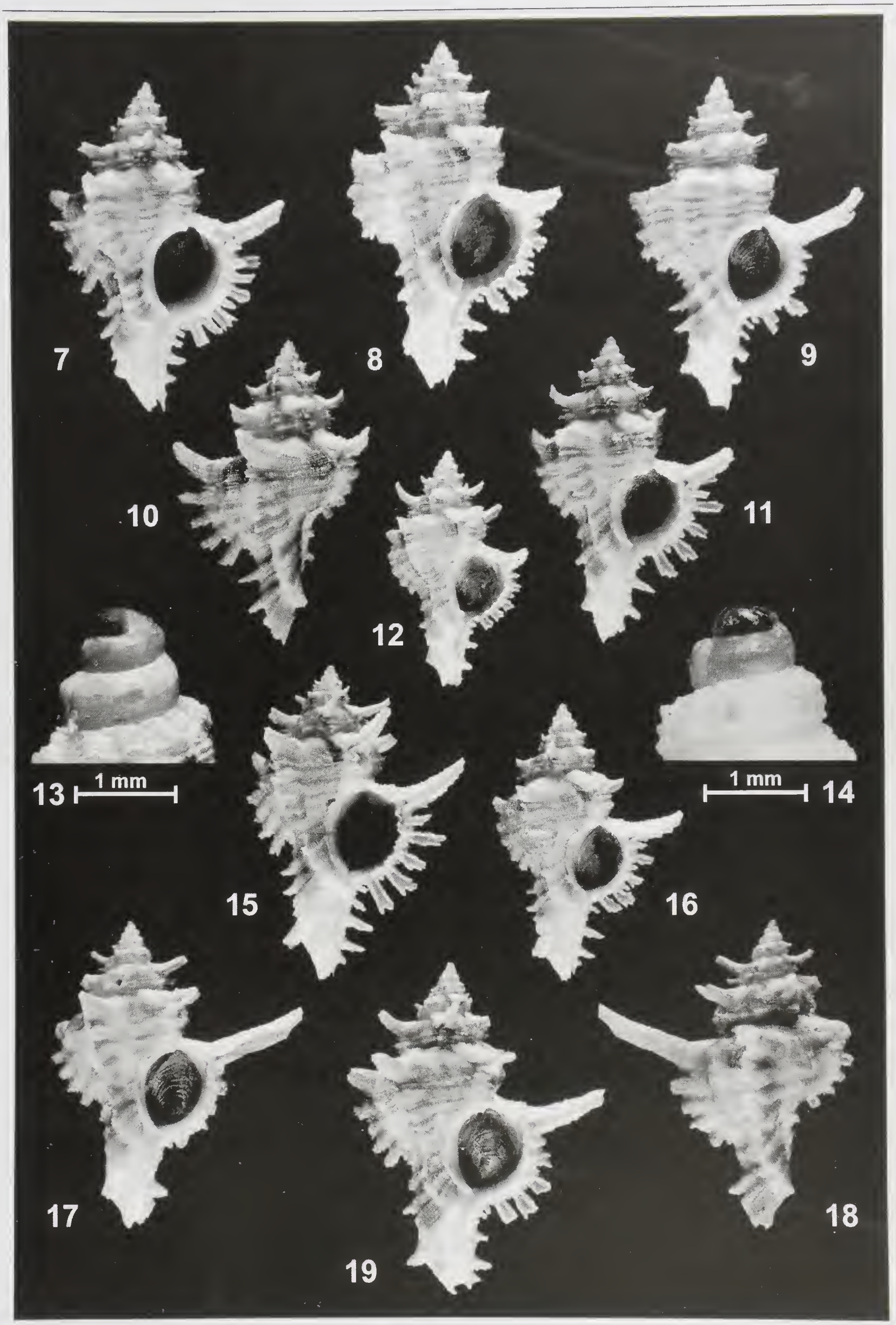
Guinée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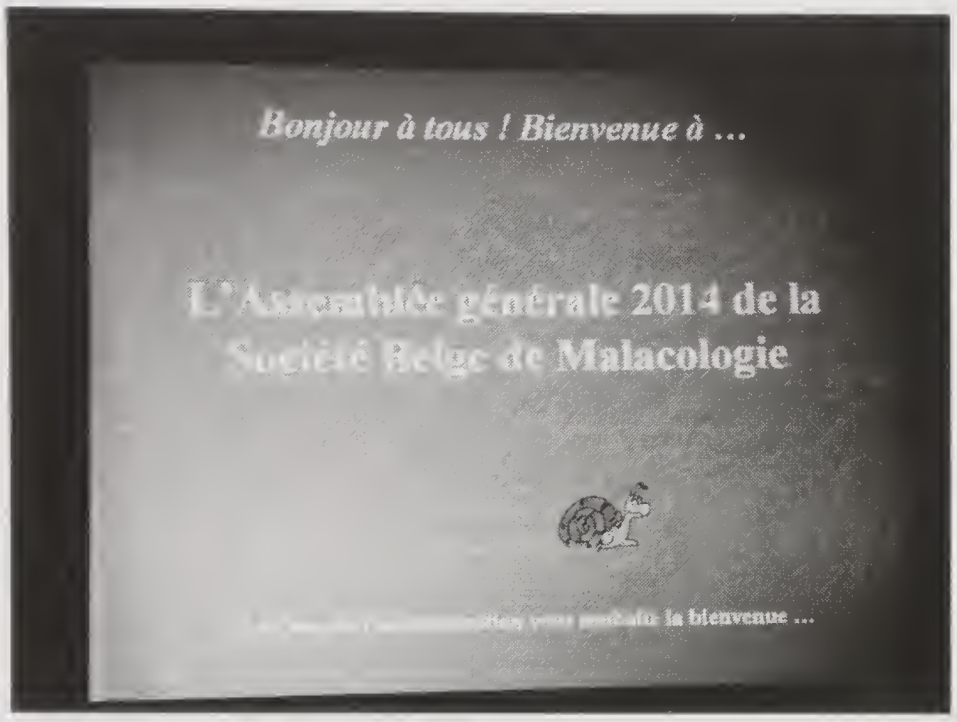
L'Assemblée Générale de la Société Belge de Malacologie du 22 mars 2014

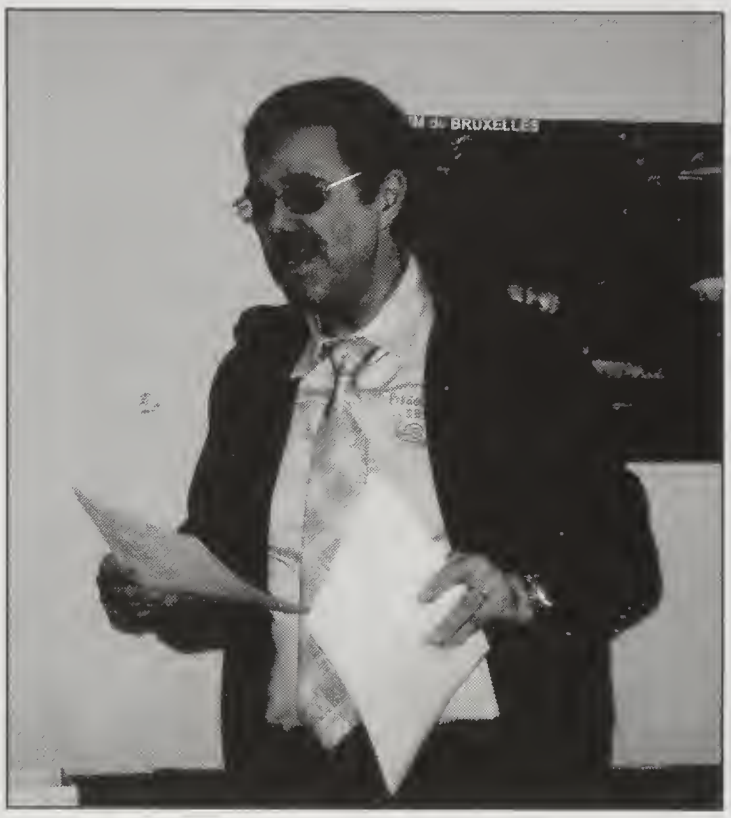
Claude VILVENS, Roland HOUART, Etienne MEULEMAN et Marc ALEXANDRE

Conformément aux statuts de la Société Belge de Malacologie A.S.B.L., nous nous sommes réunis en Assemblée Générale le samedi 22 mars 2014 pour commenter ce qui a été réalisé en 2013, pour préparer nos réalisations de 2014 et pour fixer les cotisations de 2015.

Les thèmes suivants ont été discutés lors de cette assemblée:
- le **rapport moral** qui contient un compte-rendu de nos **réunions,** de nos **excursions**, de nos **publications**;
- un aperçu du **conseil d'administration,** des **membres** de la SBM, du **site Web** et de la **bibliothèque**;
- le **rapport financier** (bilan de l'exercice 2013 et prévisions budgétaires pour 2014);
- le tout était soutenu grâce à une projection Power Point.

Après l'AG, le conseil d'administration s'est réuni pour mettre en place le Conseil d'administration.





1. RAPPORT MORAL

1.1 Les réunions

En 2013, nous nous sommes retrouvés 8 fois au cours de réunions (dans notre local situé rue de Genève, 470b à Schaerbeek) et 2 fois au cours d'excursions. En ce qui concerne les réunions :

1) Le **23 février 2013**, une conférence d'Etienne Meuleman : **A la découverte des coquillages au travers de l'illustration naturaliste**

2) L'**Assemblée Générale** du **23 mars** nous a permis comme tous les ans de faire le point sur ce qui avait bien ou moins bien fonctionné en 2013.

3) Le **27 avril**, **Marc Alexandre** nous a dressé **Un panorama des Haliotidae**.

4) Le **15 juin**, tout le monde a participé au **Quiz de la SBM**. Les questions avaient été préparées par une demi-douzaine de membres.

5) Le **7 septembre**, lors de la reprise de contact après les deux mois de vacances, nous avons lancé l'**Atelier Posters** de la SBM.

6) Le **12 octobre**, nous avons présenté notre **Exposition** réalisée par les membres de la SBM : une manifestation devenue incontournable depuis de très nombreuses années.

7) Le **9 novembre**, nous avons poursuivi l'**Atelier Posters** de la SBM.

8) Le **14 décembre**, Christiane Delongueville et Roland Scaillet nous ont proposé une conférence sur leurs **Récoltes malacologiques en République turque de Chypre du Nord**

Peu de sociétés peuvent s'enorgueillir d'un tel agenda d'activités : c'est l'occasion de remercier chaleureusement toutes celles et tous ceux qui ont consacré beaucoup de temps à la préparation de ces exposés qui font que notre ASBL mérite bien de le nom de "Société Belge de Malacologie".
Bien sûr, nous n'avons toujours pas changé d'avis : outre le côté didactique, les réunions sont une occasion de rencontre et elles nous offrent également l'opportunité d'échanger des idées, des nouvelles, des impressions, et de s'offrir le ou les coquillages recherchés grâce aux très sympathiques membres qui apportent des coquillages et qui garnissent nos tables !

1.2 Nos excursions et activités extérieures

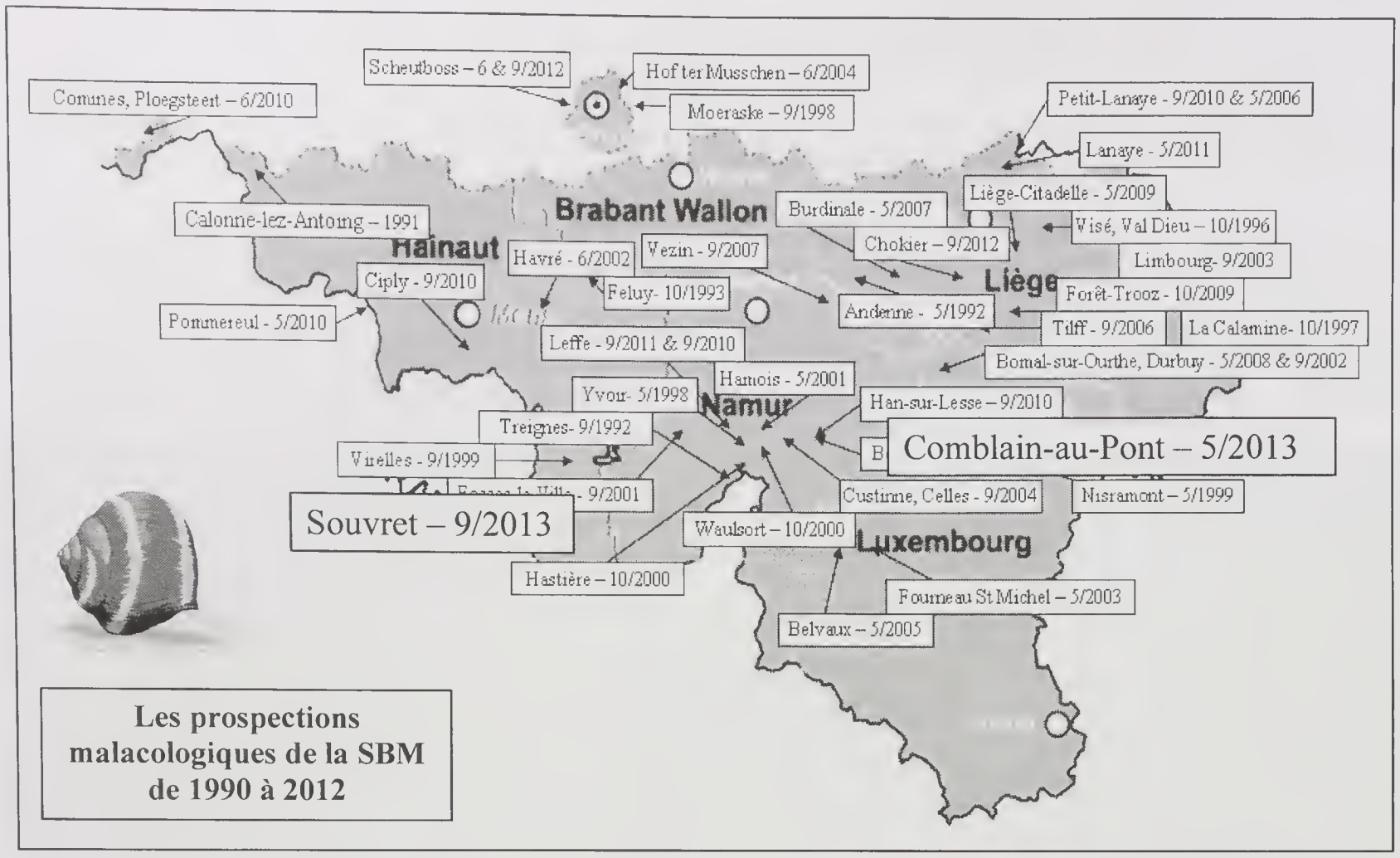
Nous avons également exploré plusieurs sites intéressants de la région wallonne :

1) Le **25 mai**, nous avons exploré la réserve des **Roches Noires à Comblain-au-Pont** : nombreuses espèces observées avec la participation d'une étudiant français de l'Université de Lille réalisant son Travail de fin d'études de master axé sur la malacologie.

2) Le **29 septembre**, la SBM a tenu le stand "Malacologie" pour la Régionale Natagora Liège et Basse-Meuse lors de **la fête des 10 ans de Natagora**. Gros succès avec environ 150 éventails escargots distribués.

3) Le **21 septembre**, nous avons **introspecté le terril du site "Six Périer-Chenoit" à Souvret** (Hainaut) : c'est avec un certain étonnement que nous avons pu constater que ce biotope est riche en mollusques.

Ces excursions nous ont permis de compléter très utilement l'inventaire de la faune malacologique en Wallonie et en Belgique. Un fameux bilan sur les 20 dernières années ☺ !



1.3 Nos publications

a) Novapex

Quatre numéros de Novapex ont été publiés en 2013 pour un total de **106 pages**. Dix-sept articles ont représenté 8 pays et rassemblé les auteurs suivants: P. Bail (France), A. Limpus (Australie), W.G. Lyons, R. Salisbury, M. Severns, M. A. Snyder et G.T. Watters (Etats-Unis), E. Rolán et F. Rubio (Espagne), R. Fernández-Garcés (Cuba), M. Boutet, J.C. Martin, J. Pelorce et J. Tröndlé (France), K. Fraussen, R. Goethals, R. Houart, D. Monsecour et Y. Terryn (Belgique), P. Stahlschmidt (Allemagne) et S. Gori (Italie).

Comme tous les ans, les familles et super-familles abordées furent variées: Buccinidae, Columbellidae, Conidae, Costellariidae, Fasciolariidae, Mitridae, Murchisonellidae, Muricidae, Rissooidea, Terebridae et Volutidae, se sont partagés les quatre numéros.

Vingt-sept nouvelles espèces et **un nouveau genre** ont été décrits, ce qui porte le total des nouvelles espèces décrites dans Novapex, depuis sa création en 2000, à 576 et le nombre de nouveaux genres à 5. Ces articles ont également comportés un total de 11 planches photos "pleine page" en couleur, 16 en noir et blanc et de nombreuses figures ou photographies dans le texte.

L'année 2013 fut encore très positive du point de vue des articles reçus et publiés dans Novapex et comme nous l'écrivions l'an dernier, nous tenons à cœur de garder la même orientation pour 2014 avec toujours le même objectif: faire progresser la science et contribuer à la connaissance du petit monde des mollusques. Malheureusement, comme toujours également, la publication de Novapex et notamment des planches couleurs dépend de notre budget, qui lui-même est tributaire des cotisations, des dons éventuels, du remboursement de quelques planches couleurs et de subsides que nous recevons annuellement et qui sont mentionnés dans notre bilan financier ci-après.

b) Novapex/Société

Sur un total de **104 pages** (170 en 2005, 175 en 2006, 171 en 2007, 141 en 2008, 172 en 2009, 153 en 2010, 132 en 2011, 150 en 2012) dans 4 fascicules agrémentés de planches et illustrations, le magazine généraliste de la SBM nous a proposé :

1) les articles originaux suivants :

C. Delongueville & R. Scaillet

- Extension de l'aire de distribution de Bornia aartseni Gofas, 2012 aux côtes atlantiques du Sud de la Péninsule Ibérique
- Rapana venosa (Valenciennes, 1846) en Mer de Marmara
- Espagne, plage de Tarifa le 26 février 2013. 1 kg de laisse de mer réduit à 2 g de coquilles à déterminer

- Analyse d'une laisse de mer récoltée à Tarifa (Espagne)
- Note concernant la présence de Monetaria annulus (Linnaeus, 1758) dans le Golfe de Gabès

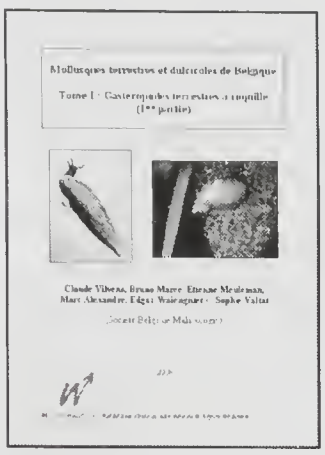
3) les comptes-rendus d'événements de la vie de la SBM comme l'Assemblée Générale de la Société Belge de Malacologie du 23 mars 2013 et l'exposition 2013 de la SBM

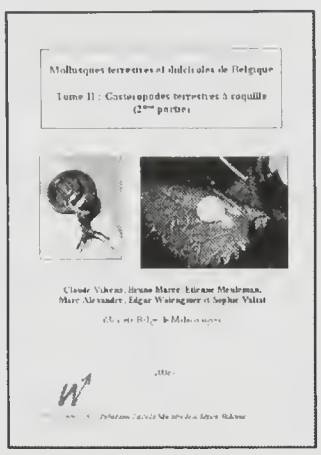
4) les comptes-rendus d'excursion

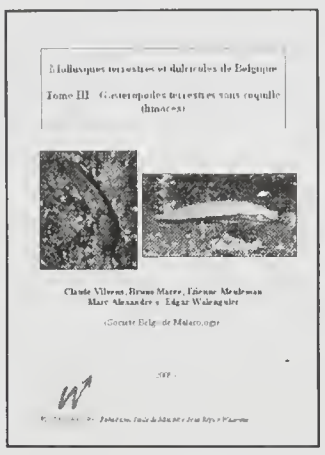
5) les rubriques habituelles "Prochaines activités", "Quoi de neuf ?", "Quelques nouvelles publications", "Nous avons reçu", "Morceaux choisis" et "L'écho des réunions".

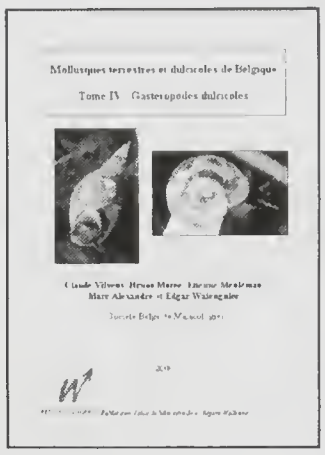
c) Les mollusques terrestres et dulcicoles de Belgique

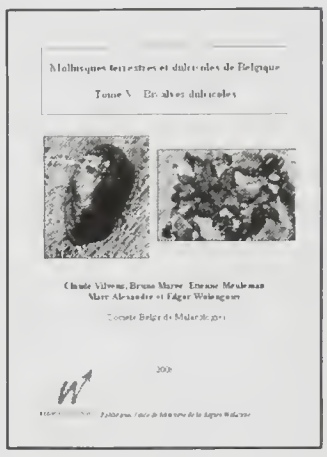
Pour rappel, ces publications visent à fournir des critères de détermination et à faire découvrir et apprécier les mollusques par les naturalistes et le grand public en général. A l'heure actuelle, plus de 400 exemplaires ont été vendus et il nous a donc fallu réimprimer à nouveau, en en profitant pour réaliser quelques mises à jour.





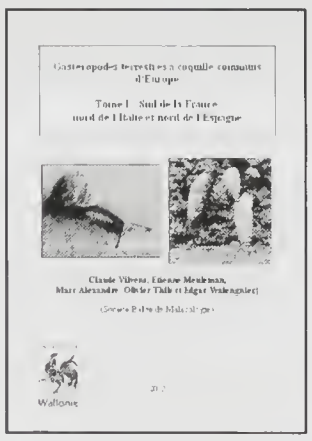


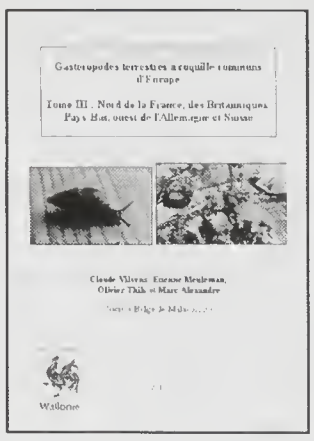




d) Les gastéropodes terrestres communs d'Europe

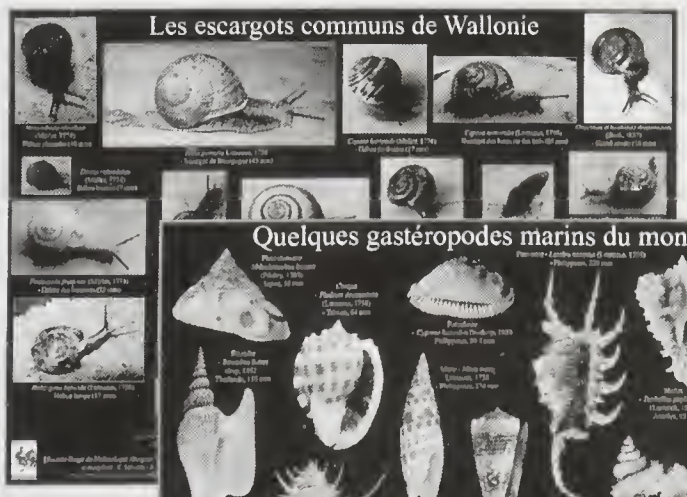
Ces publications sont la suite naturelle des précédentes et concernent les "gastéropodes des vacances". Plus de 40 exemplaires des tomes I et II ont déjà vendus. Le tome III vient de paraître et les tomes suivants sont déjà en préparation.

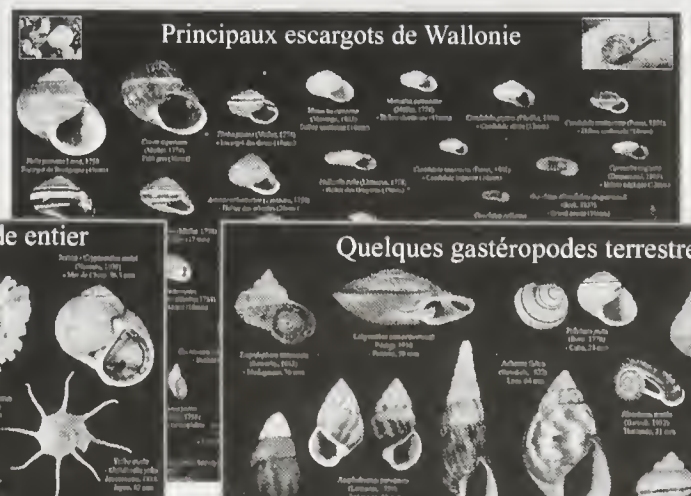


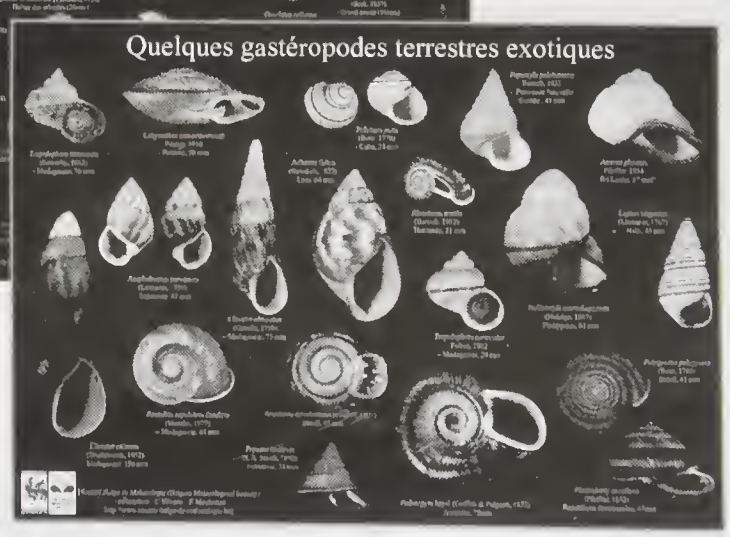


e) Les posters

Les posters remportent un franc succès auprès du public naturaliste et nous en avons produit de nouveaux.







1.4 Le conseil d'administration

Le conseil d'administration se réunit généralement après chaque réunion pour discuter de points importants concernant la vie de la Société: le calendrier des prochaines activités, la trésorerie, Novapex et Novapex/Société, le site internet, la bibliothèque mais aussi les tarifs postaux, la publicité, les cotisations, la liste des membres, et mille autres choses… Comme tous les ans également, nous voudrions encore vivement rappeler que toute personne désirant faire partie de ce comité est évidemment plus que la bienvenue. Il n'y a pas de condition, sinon celle de faire partie de la Société en tant que membre ordinaire, et bien sûr, de passer par les élections. Et cette année, **deux nouveaux membres ont été mis en place au C.A.** (voir les élections ci-dessous).

1.5 Les membres

Nous comptions 111 membres effectifs en ordre de cotisation pour 2013 dont une douzaine d'institutions. La répartition géographique était de 40 membres (+1 familial) résidant en Belgique et 71 hors Belgique. De nouveaux membres nous ont rejoint tout au long de 2013 (et cela semble continuer en 2014) mais d'autres nous ont malheureusement quittés. Nous comptions une quarantaine d'échanges en 2013.

1.6 Le site web

Une **soixantaine de pages html** agrémentées de nombreuses photos :

- un fournisseur d'informations générales : présentation de la SBM, de ses contacts, présentation de la malacologie, dates des grandes marées
- un serveur d'informations pratiques : agenda des réunions, annonces et informations pratiques pour les excursions, aspects divers de la vie de la société, publicité pour les brochures des Terrestres,
- une référence didactique : table des matières de Novapex par auteurs (bientôt, idem pour Novapex/Société), dictionnaire de malacologie en français, bibliographies de malacologues célèbres, description d'expéditions maritimes célèbres ainsi que nombreux liens utiles
- une galerie de photographies illustrant le monde des mollusques : sans doute la partie du site qui intéressera le plus le grand public.

D'après les statistiques de notre serveur d'hébergement, le site de la SBM reçoit entre 500 et plus de 700 visites par mois. Il faut cependant déplorer que peu de nouvelles pages didactiques (malacologues, définition de termes, expéditions) aient été ajoutées durant 2012.

1.7 La bibliothèque

La bibliothèque de la SBM continue à s'étoffer, les revues en provenance de nombreux pays européens et extra-européens nous parviennent régulièrement. Vous pouvez d'ailleurs vous en rendre compte lors de la présentation des nouveautés par Claude au début de nos diverses rencontres.

N'oubliez pas non plus que cette documentation est accessible à tous et consultable sur simple demande. La recherche d'articles sur certains sujets est facilitée actuellement grâce à Internet qui offre des moteurs de recherches pratiques pour vous diriger vers certaines bases de données (de plus en plus de sommaires de revues sont consultables sur la toile).

2. RAPPORT FINANCIER

Le **rapport financier** (bilan de l'exercice 2013 et prévisions budgétaires pour 2014) a été présenté aux membres.

Solde créditeur au 1er janvier 2013	8.779,08 €		
Cotisations	5.596,00 €		
Vente publications	683,15 €		
Vente édition Terr. Belgique + Terr. Vac + Posters	803,45 €		
Remboursement planches couleur et publ.	370,00 €		
Dons anonymes	1.129,40 €		
Bibliothèque année 2012	45,00 €		
Tombola	0,00 €		
Publicité	0,00 €		
Intérêts fond de roulement	11,97 €		
Subsides Région Wallonne 2012	1.500,00 €		
Subsides Gouvernement Wallon 2013	0,00 €		
Frais de publication			5.792,01 €
Frais édition Terr. Belgique + Terr. Vac.			1.126,56 €
Frais d'expédition			1.320,80 €
Location salle 2013			360,00 €
Abonnements aux revues			196,70 €
Gestion Banque de la Poste			32,37 €
Gestion Banque ING			167,70 €
Divers			357,37 €
Totaux	18.918,05 €		9.353,51 €
Solde créditeur au 31 décembre 2013			9.564,54 €
Total général			18.918,05 €

Solde créditeur au 1er janvier 2014	9.564,54 €		
Cotisations	5.600,00 €		
Subsides Région Wallonne 2013	1.500,00 €		
Subsides Région Wallonne 2014	1.500,00 €		
Subsides Région Bruxelloise 2014	1.000,00 €		
Vente édition Terr. Bel. + Terr. Vac.	1.000,00 €		
Frais de publication			6.000,00 €
Frais édition Terr. Dulc. Belgique + Terr. Vac			1.150,00 €
Frais d'expédition			1.350,00 €
Location salle			405,00 €
Abonnements aux revues			200,00 €
Gestion Banque de la Poste			0,00 €
Gestion Banque ING			145,00 €
Divers			300,00 €
Totaux	20.164,54 €		9.550,00 €
Solde créditeur au 31 décembre 2014			10.614,54 €
Total général			20.164,54 €

Décharge est donnée aux administrateurs.

3. ELECTIONS

Nous avons reçu deux candidatures pour le Conseil d'administration. Les deux candidats (**Christiane Delongueville** et **Roland Scaillet**) ont été élus au Conseil d'administration à l'unanimité. D'autre part, notre secrétaire actuelle, **Annie Langleit**, ne sollicitait plus la reconduction de son mandat d'administratrice. Et aucun autre mandat d'administrateur en place n'était terminé et aucune autre démission n'a été enregistrée.

4. COTISATIONS 2015

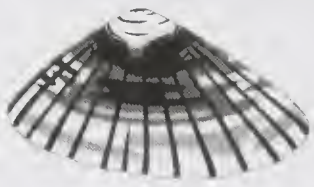
Malgré, notamment, l'augmentation des frais en relation avec nos publications (frais d'envois, frais d'impression), il a été décidé de conserver les cotisations inchangées pour l'année 2015.

5. DIVERS

Comme chaque année, nous avons clôturé l'assemblée générale par un petit cadeau, ceci afin de remercier les membres présents de nous avoir accompagnés tout au long de cette année 2011. Cette année, il s'agissait encore d'une boîte de pralines en forme de coquillages.

Ensuite fut offert le traditionnel **verre de l'amitié** ! MAIS il n'y avait pas que cela : notre secrétaire démissionnaire **Annie Langleit** a donc décidé de prendre sa retraite du CA. Nous avons voulu la remercier pour tout le travail investi durant toutes ces années par un petit cadeau lui marquant notre reconnaissance (une broche en forme de pecten ☺)).

MERCI A TOUS d'être venus nombreux pour nous soutenir lors de cette Assemblée Générale !



L'écho des réunions

Étienne MEULEMAN et Claude VILVENS

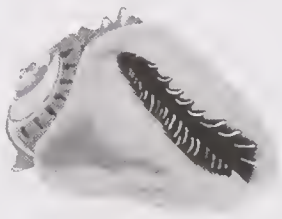
Réunion du 22 février 2014 (CV) → **M. Alexandre : L'élevage des Haliotis**

Notre trésorier y est donc arrivé ! A quoi donc ? Mais à pénétrer le monde très fermé des éleveurs d'Ormeaux (Haliotis) en Bretagne. Car ils ont leur secrets, mais ont révélé quelques-uns à Marc qui s'est appliqué à nous expliquer ce qu'il avait vu chez ces "halioticulteurs" (je ne suis pas sûr que cela se dise ;-))

Nous avons ainsi découvert à quoi ressemblait une ferme à Haliotis, quels problèmes il faut résoudre pour parvenir au succès, quelles techniques il faut maîtriser.

Merci Marc de nous avoir révélé ce monde secret.

Claude Vilvens



Nous avons reçu

Etienne MEULEMAN

LES NATURALISTES DE LA HAUTE-LESSE

(Belgique)
N°276, mars-avril 2014

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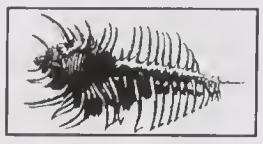

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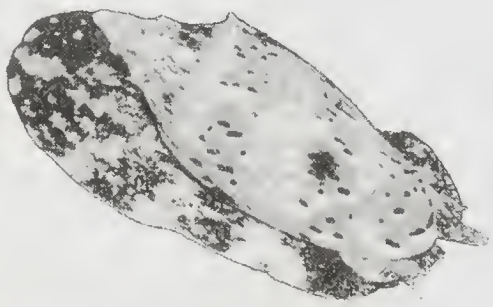

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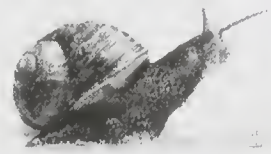

ISSN 1565-1916
Published twice a year since 2000
Yearly subscription rate 20 €

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Grandes marées de l'année 2014

Christiane DELONGUEVILLE et Roland SCAILLET

- Enfin une bonne année avec des marées de 115 en mars et en septembre. En février, août et octobre, les marées présenteront également de beaux coefficients supérieurs à 110. Voilà de quoi nous réjouir !

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Mercredi 1	(96) - 100
	Jeudi 2	104 - 107
	Vendredi 3	108 - 108
	Samedi 4	106 - 103
	Jeudi 30	(95) - 101
	Vendredi 31	107 - 111

Février	Samedi 1	113 - 114
	Dimanche 2	113 - 110
	Lundi 3	106 - 101
	Vendredi 28	(95) - 102

Mars	Samedi 1	108 - 112
	Dimanche 2	114 - 115
	Lundi 3	114 - 112
	Mardi 4	108 - 102
	Dimanche 30	104 - 107
	Lundi 31	109 - 109

Avril	Mardi 1	108 - 106
	Mercredi 2	102 - (98)

Mai	-	-

Juin	Samedi 14	(98) - 100
	Dimanche 15	100 - 99

Juillet	Dimanche 13	101 - 105
	Lundi 14	106 - 107
	Mardi 15	106 - 104
	Mercredi 16	101- (96)

Août	Dimanche 10	(95) - 101
	Lundi 11	106 - 110
	Mardi 12	112 - 113
	Mercredi 13	112 - 110
	Jeudi 14	106 - 101

Septembre	Lundi 8	(97) - 104
	Mardi 9	109 - 113
	Mercredi 10	115 - 115
	Jeudi 11	114 - 111
	Vendredi 12	106 - 100

Octobre	Mardi 7	(96) - 102
	Mercredi 8	106 - 109
	Jeudi 9	111 - 111
	Vendredi 10	109 - 106
	Samedi 11	102 - (96)

Novembre	Jeudi 6	(98) - 100
	Vendredi 7	101 - 101
	Samedi 8	100 - (98)

Décembre	-	-

Conseils pour une marée réussie et soucieuse de l'environnement : Remettez toujours les pierres déplacées en bon ordre. Observez, photographiez et n'échantillonnez que le strict nécessaire. Soyez prudents et renseignez-vous sur les heures des marées à l'endroit où vous vous trouvez.

REFERENCE :

Annuaire des Marées pour 2014 - Ports de France - Métropole - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Paris - 256 p.*

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Quarterly of the Belgian Malacological Society

VOL. 15 (3-4) 2014 10 OCTOBRE

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Rectifications regarding two fasciolariid names introduced by Récluz, 1844 and taxa to which those names have been related (Gastropoda: Fasciolariidae: Peristerniinae)

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KEYWORDS. Fasciolariidae, Récluz, *Latirus*, *Turbinella*, *Peristernia*.

ABSTRACT. *Turbinella philberti* and *T. tessellata*, both Récluz, 1844, are redescribed, figured and discussed, as are two Reeve taxa confused with them: *T. belcheri* and *T. candelabrum*. A lectotype is selected for *T. philberti* and *T. tessellata* Récluz is regarded as a *nomen dubium*. We also discuss *T. tessellata* Kobelt *in* Küster & Kobelt, 1874, and *Peristernia castanoleuca* Tapparone-Canefri, 1879, which complete this group of confused names.

INTRODUCTION

Constant A. Récluz (1797?-1873) was one of many European workers who described species of mollusks discovered in the Cuming collection (Dance, 1986: 123). In 1844 he published accounts of two fasciolariids, *Turbinella philberti* and *T. tessellata*, with a written description of each species and a separately published drawing (Figs 1, 7). No extant type material is known for either taxon, but the identity of *T. philberti* is clear and an inconclusive estimate can be made as to that of *T. tessellata*.

Turbinella philberti is a *Latirus* which is readily evident from the original figure; the size stated for the specimen is 56 mm SL. The figure clearly shows the characteristic deeply compressed suture and prominent undulant anterior cord on the body whorl, and we select the shell depicted in the original figure as lectotype of *T. philberti*. We also illustrate two other specimens (Figs 2, 3) to show variation; the specimen in Fig. 2 is similar in size and sculpture to Récluz' illustration, and a much larger specimen is shown in Fig. 3

Turbinella philberti 'Récluz' was redescribed by Reeve (1847: pl. 12, fig. 63), but the shell he treated (Fig. 10) is not the Récluz species. This discrepancy was recognized by Tapparone-Canefri (1879: 317), who introduced the name *Peristernia castanoleuca* for the species that Reeve misidentified. However, the Tapparone-Canefri name was soon forgotten in the literature and the name *P. philberti* (Récluz, 1844) continued to be applied erroneously to *P. castanoleuca*. Tapparone-Canefri's type material for *P. castanoleuca* (Fig. 11) was reexamined by Snyder & Callomon (2010), who confirmed conspecificity of that species with Reeve's illustrated specimen.

Reeve compounded his error by describing in the same publication (1847: pl. 2, fig. 1) a new species, *Turbinella candelabrum*, which is a subjective synonym of *T. philberti* Récluz. We illustrate the figured syntype of *T. candelabrum* (NHMUK 1968428), herein selected as the lectotype (Fig. 4).

Latirus philberti has been figured often in recent literature but almost always misidentified as *L. belcheri* (Reeve, 1847). We examined the figured syntype of *Turbinella belcheri* Reeve (NMW 1955.158.01407), herein selected as the lectotype (Fig. 5). It measures 49.7 mm in length and agrees in all particulars with Reeve's original description. *Latirus philberti* bears only superficial resemblance to *L. belcheri* and attains more than twice the size of the latter species.

Methods and Materials

Specimens were examined in the collection of the Academy of Natural Sciences of Drexel University (ANSP), which now includes the former collection of Martin A. Snyder, and in the collection of William G. Lyons.

Abbreviations

ANSP: Academy of Natural Sciences of Drexel University, Philadelphia, PA, USA
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MHNG: Muséum d'Histoire Naturelle, Genéve, Switzerland
MSNG: Museo Civico di Storia Naturale "Giacomo Doria," Genoa, Italy
NHMLAC: Natural History Museum of Los Angeles County, CA, USA
NHMUK: The Natural History Museum of the United Kingdom, London,England
NMW: National Museum of Wales, Cardiff, Wales
SBMNH: Santa Barbara Museum of Natural History, CA, USA
SL: shell length
USNM: National Museum of Natural History, Washington, DC, USA

SYSTEMATICS

Family **FASCIOLARIIDAE** Gray, 1853
Subfamily **PERISTERNIINAE** Tryon, 1880
Genus ***Latirus*** Montfort, 1810
Type species by monotypy: *Latirus aurantiacus* Montfort, 1810, = *Latirus gibbulus* (Gmelin, 1791), Recent, Indo-West Pacific.

Latirus philberti (Récluz, 1844)
Figs 1-4

Turbinella philberti Récluz, 1844a: 48; 1844b: sp. 93 (Philippines).
Turbinella candelabrum Reeve, 1847: pl. 2, fig. 9 (St. Elena, Colombia); Hertlein & Strong, 1951: 80 (dismissed as eastern Pacific species).
Lathyrus candelabrum (Reeve): Mørch, 1852: 100 (Panama).
Turbinella polygona (Gmelin): G. B. Sowerby II, 1852: 329, pl. 18, fig. 383 (figured shell *philberti*); *non Murex polygonus* Gmelin, 1791, = *Latirus polygonus*, Recent, Indo-west Pacific.
Latirus (Plicatella) candelabrum (Reeve): H. & A. Adams, 1853: 153; Paetel, 1883: 24.
Lathirus candelabrum (Reeve): Schaufuss, 1869: 34.
Turbinella (Plicatella) candelabrum (Reeve): Kobelt, 1876: 19.
Latirus candelabrum (Reeve) [Eastern Pacific]: Kobelt, 1877: 58 (St. Elena, Colombia); Paetel, 1887: 162; Melvill, 1891: 404 (Colombia); M. Smith, 1944: 32 (Panama to St. Elena); Burch, 1945: 4, 5 (Panama); Hoffstetter, 1954: 406 (Ecuador); Keen, 1971: 613, fig. 1326 (Colombia); Vander Ven, 2005: 24 (Panama); [Western Pacific]: Hidalgo, 1904: 36 (Philippines); Adam & Leloup, 1938: 186 (Amboina); Kuroda & Habe, 1952: 62 (Japan); Kuroda, 1960: 31 (Okinawa); Higo & Goto, 1993: 240 (Japan); Higo *et al.*, 1999: 261 (Japan); Mallard & Robin, 2005: 17 (Okinawa to Ecuador).
Latirus (Plicatella) philberti (Récluz): Tapparone-Canefri, 1879: 317.
Latirus polygonus var. *candelabrum* (Reeve): Tryon, 1881: 88 (Colombia); Faustino, 1928: 271 (Philippines).
Latirus philberti (Récluz): Paetel, 1887: 164.
Latirus polygonum var. *candelabrum* (Reeve): Adam & Leloup, 1938: 186.
Latirus candelabris [*sic*] (Reeve): Trew, 1990: 2.
Latirus belcheri auctt., *non* Reeve, 1847: Quirk & Wolfe, 1974: 26, color fig. 2 (Pacific; to 3 inches SL); Wolfe, 1975: 5, unnumbered pl., figs (western Pacific, common in Philippines); Springsteen & Leobrera, 1986: 174 (Philippines); 16 more recent citations.
Non Turbinella philberti (Récluz) Reeve, 1847: pl. 12, sp. and fig. 63; *nec Peristernia philberti* (Récluz), *auctt.*; both = *Peristernia castanoleuca* Tapparone-Canefri, 1879.

Type material. Lectotype specimen figured by Récluz, 1844b, selected herein (Fig. 1).

Type locality. Manila, Philippine Islands.

Distribution. Western Pacific Ocean; southern Japan to the Philippines, Malaysia, Indonesia, North Borneo, Queensland, Australia, New Caledonia, Palau and Fiji; tropical eastern Pacific?

Description. Shell large for genus, to about 108.3 mm SL, solid, whorls subtabulate, strongly compressed at suture and bearing prominent axial ribs and spiral cords, two cords at periphery and single cord at base much larger than others; markings dominated by many wider-than-long brown rectangles on white and/or yellowish or orange background. Protoconch rather tall, of about 2 smooth whorls, terminating abruptly. Teleconch of about 8 whorls, each with a rather flat sutural ramp and broadly rounded axial ribs; suture appressed, undulating in concert with axial ribs and intercostal areas; whorls of spire with 8-9 ribs crossed by smooth spiral cords as follows: 2-3 small cords on sutural ramp of early whorls, increasing by intercalation to about 7 cords on ramp of body whorl; ribs elevated, node-like, reduced to broadly triangular points at periphery, which is marked by single strong spiral cord, bordered anteriorly by single smaller cord, followed by another large cord, then by 0-4 smaller cords in space between large cord and anterior suture; body whorl subquadrate, strongly shouldered, with 2 strong cords at periphery and single, markedly undulant cord at anterior end, and with as many as 10 axial ribs; ribs weaker on sutural ramp, stronger and separated by rather deep intercostal spaces between peripheral and anterior undulant cords; 5-6 smaller cords crossing tops of ribs between larger cords; base contracting quickly, crossed by about 6 cords of

various sizes; siphonal process rather long, with straight sides and transversely tapered tip, surface bearing about 12 transverse cords of various sizes, 3 or 4 usually more prominent than others. Aperture subquadrate, with narrow posterior sinus; outer lip strongly angled at junctions with peripheral and undulant cords, lip edge nearly straight between angles, edge crenulated by termini of smaller cords and interspaces of body whorl, with deeper, wider sinuses at angles; inside of outer lip with as many as 20 thin, straight, uninterrupted emergent lirae that terminate before lip edge; inner lip straight and adherent anteriorly, arcuate and sometimes detached posteriorly on larger shells, with low swelling on parietal wall at posterior sinus and 1 or 2 low, oblique, nearly obsolete plicae near anterior end of columella; siphonal canal rather long, narrow, with straight edges, elevated inner edge adjacent to prominent elongate pseudo-umbilicus.

Protoconch and first 1-2 whorls of teleoconch pink in fresh material, fading to white in older shells; spire and body whorl white, overlain by broad streaks of rich brown, which is dominant color on ramp, axial ribs, base and siphonal process; brown areas crossed by small white, orange, or lighter brown spiral cords, dividing larger areas into smaller, wider-than-long, spirally aligned brown rectangles; largest (peripheral and undulant) cords usually bright white but occasionally orange or yellow; intercostal areas usually with prominent patches of white; edge of outer lip and outer edge of siphonal canal with many dark brown spots, often paired, and sometimes extended beyond plane of lip as denticles, representing extensions of grooves between smaller spiral cords of body whorl; interior of pseudo-umbilicus dark brown, nearly black at tip; shell interior entirely white. A few shells almost entirely yellow-orange outside, white within.

Operculum black, thick, solid, elongate, distally rounded, tapering and curving toward anterior tip with terminal nucleus; outer surface bearing many incised concentric growth increments. Periostracum transparent, tan, smooth, very thin. Radula unknown.

Remarks. We found two specimens labeled "*T. philberti* Récluz" purported to be from the Récluz collection, in the Delessert collection at MHNG. Upon examination, however, these proved to be *Peristernia castanoleuca*, indicating they were probably acquired after publication of Reeve (1847) and should not be afforded status as types.

The earliest misidentifications of *Latirus philberti* as *L. belcheri* seem to have been by Quirk & Wolfe (1974) and Wolfe (1975), who published the name with excellent photographs of Philippines shells. The error was repeated by Springsteen & Leobrera (1986) in their *Shells of the Philippines* and became widespread soon thereafter.

We examined 93 specimens of *L. philberti* (35 specimens in LC; others at ANSP) ranging from 26.0 to 106.9 mm SL (average 74.1 mm). The combination of spire whorls deeply compressed at sutures, the pattern of multiple, widely elongate rectangular brown markings, the prominently undulant anterior cord on the body whorl, and the relatively long, narrow, straight-sided siphonal process distinguish shells of *L. philberti* from those of all its nearest congeners, which include *L. barclayi* (Reeve, 1847), *L. belcheri* (Reeve, 1847), *L. pictus* (Reeve, 1847) and *L. polygonus* (Gmelin, 1791). The largest known specimen of *L. belcheri* is 56.5 mm (herein). *Latirus philberti* attains about 108.3 mm SL (Barbier *et al.* 2009: 117, as *belcheri*, *auctt.*) and is exceeded in size only by *L. barclayi* (111.4 mm SL) and *L. polygonus* (117.6 mm SL) (record sizes from Barbier *et al.* 2009: 117, 119).

An orange and white shell, with relatively subdued spiral cords and with few or no brown markings distinguish *L. barclayi* from *L. philberti*, leaving only *L. polygonus* with which it may be confused. Shells of *L. polygonus* have less constricted spire whorls and less elevated axial ribs crossed by generally weaker spiral cords; apices of the ribs are usually rounded, seldom acute, and never produced as blunt, triangular peripheral spines; the siphonal process of *L. polygonus* is relatively shorter and wider, and the anterior cord on the body whorl may be undulant, as on *L. philberti*, but it is seldom as well developed and generally has fewer undulations, a consequence of fewer axial ribs on the body whorl. Western Pacific shells of *L. polygonus* are usually yellow (Fig. 8), with a few relatively narrow, irregular brown streaks on the sutural ramp continuing onto the axial ribs, and with more prominent brown patches on ribs of the body whorl; the widely rectangular brown markings on the sutural ramp and ribs of *L. philberti* are absent or represented only by a few brown spots on *L. polygonus*. Wolfe (1975: 5) noted that denticles on the outer lip of *Latirus philberti* (as *belcheri auct.*) are blackish brown and the color is visible inside the aperture, whereas the aperture of *Latirus polygonus* has an orange-brown margin and the denticles are of the same color.

The type locality for *T. candelabrum* is St. Elena, West Colombia, based on material in the Cuming collection (Reeve, 1847). Eastern Pacific occurrences of *L. candelabrum* have been mentioned by Mørch (1852: 100), Kobelt *in* Küster & Kobelt (1873: 52, 53, pl. 9b, figs 1, 2), Kobelt (1876: 19; 1877: 58), Paetel (1883: 24; 1887: 162), M. Smith (1944: 32), Burch (1945: 4), Hoffstetter (1954: 406), Keen (1971: 613) and Vander Ven (2005: 24), but we were unable to locate specimens to confirm that occurrence. Lindsey Groves informed us that the only lot listed for the species at NHMLAC was a juvenile *Triplofusus princeps* (G. B. Sowerby I, 1825) whose identity was corrected a decade ago (LG email to WGL 8/1/2011). Dr. Karen Vander Ven provided a photo that revealed her record to be of a species of *Leucozonia*. Particularly perplexing is the report by Keen (1971),

who reported an 85-mm specimen taken off Punta Cotuda, Colombia in 9-13 m during the 1968 Te Vega Expedition; Keen did not figure the specimen, instead using Reeve's figure as an illustration. We could not locate the Te Vega specimen in several likely major repositories (CAS; NHMLAC; SBMNH; USNM).

Early in the last century, Hidalgo (1904) reported *L. candelabrum* from Cebu, Philippines. Reports of the species at Amboina, Indonesia (Adam & Leloup, 1938), Japan (Kuroda & Habe, 1952), and Okinawa (Kuroda, 1960) followed. We illustrate Reeve's figured syntype of *T. candelabrum* (Fig. 4) which is indistinguishable from some specimens of *T. philberti* that we examined from the western Pacific. From this we conclude that *T. candelabrum* is a later name for *T. philberti*, and the species lives principally in the western Pacific.

Hertlein & Strong (1951) proposed that, *Latirus candelabrum* may not occur in the eastern Pacific. However, despite difficulties in verifying earlier records, hints that it may be there were given by Shasky (1995) and Skoglund (2002). Shasky figured as *Latirus belcheri* a small (22.9-mm) shell provided by a divemaster on an expedition that Shasky accompanied to Isla Clarion, Islas Revillagigedo, Mexico. One of us (MAS) examined the shell (SBMNH 151703) and confirmed it to be an immature *L. philberti*. Vermeij & Snyder (2006) accepted the record as from Isla Clarion, but the shell was sent without data to Shasky sometime after the expedition returned, and its actual provenance may be uncertain. Skoglund (2002: 142) also noted a record of *L. belcheri* at Isla Socorro, Islas Revillagigedo, reported by Villalobos (1960), but we failed to find that record in Villalobos' report. Thus, uncertainty about New World records of *Latirus philberti* continues.

Latirus belcheri (Reeve, 1847)
Figs 5-6

Turbinella belcheri Reeve, 1847: pl. 4, fig 22 (Cargados Garajos); Kobelt *in* Küster & Kobelt, 1873: 58, 59, pl. 14, figs 3, 4 (Liukiu-Inseln).
Leucozonia belcheri (Adams & Reeve [sic]): H. & A. Adams, 1853: 154.
Latirus belcheri (Reeve): Chenu, 1859: 182, fig. 912
Turbinella (*Peristernia*) *belcheri* (Reeve): Kobelt, 1876: 25.
Plicatella belcheri (Reeve): von Martens, 1880: 245.
Peristernia belcheri (Reeve): Tryon, 1881: 79.
Latirus (Leucozonia) belcheri: Paetel, 1883: 24.
Fasciolaria belcheri (Reeve): Santos Galindo, 1977: 183.
Non Latirus belcheri (Reeve) *auctt.*, Recent, western and eastern Pacific, = *L. philberti* (Récluz, 1844); *nec L. belcheri auctt.*, Recent, Western Australia, = *Latirus* n. sp. Lyons & Snyder, in prep.

Type material. Figured syntype NMW # 1955.158.01407, SL 49.7 mm (Fig. 5).

Type locality. Cargados Garajos, central Indian Ocean.

Distribution. Southern Japan and Northern Marianas Islands; Philippines?

Description. Shell of moderate size for genus, to 56.5 mm SL, broadly fusiform, solid, with prominent, node-like ribs on spire, short, broad axial ribs on body whorl, and distinctive color pattern. Apices slightly or considerably worn on all shells; protoconch evidently small, of about 2 rapidly expanding whorls, with pointed tip. Teleoconch of about 6 rapidly expanding whorls; whorls of spire wider than long, with expansive, flat sutural ramp and 7-8 broad, acute nodes that occupy anterior quarter of whorls and form periphery; body whorl with 7-8 broad axial ribs marked by pointed nodes at periphery and anteriorly at junction with base, peripheral nodes more prominent; anterior terminus of body whorl marked by low, undulant light-colored cord emergent from upper (posterior) end of aperture, resembling those on shells of some *Leucozonia* species; base and siphonal process short, broad; whorls and base covered with numerous fine spiral threads.

Figures 1-11. Scale bar: 10 mm.
1-4. *Latirus philberti*. **1**. Original figure of *Turbinella philberti* Récluz, 1844 (lectotype); **2**. 52.9 mm SL, Calituban Island, Philippines, on mud at 9 m. ANSP 426299; **3**. 96.0 mm SL, off Balicasag Island, Panglao, Philippines. ANSP 422700; **4**. Lectotype of *Turbinella candelabrum* Reeve, 1847, 86.3 mm SL, NHMUK 1968428, synonym of *Latirus philberti*.
5-6. *Latirus belcheri*. **5**. Lectotype of *Turbinella belcheri* Reeve, 1847, 49.7 mm SL, NMW 1955.158.01407; **6**. *Latirus* cf. *L. belcheri*, 49.6 mm SL, Philippines. ANSP 422699.
7. Original figure of *Turbinella tessellata* Récluz, 1844.
8. *Latirus polygonus* (Gmelin, 1791), 72.8 mm SL, Philippines. ANSP 422701.
9. *Turbinella tessellata* Kobelt *in* Küster and Kobelt, 1876: pl. 17, fig. 7.
10-11. *Peristernia castanoleuca*. **10**. Reeve's figures of "*Turbinella philberti*" = *Peristernia castanoleuca*; **11**. *Peristernia castanoleuca* Tapparone-Canefri, 1879, lectotype, 26.2 mm SL, MSNG.

1
2a
2b
4a
4b
10 mm
5a
5b
3a
3b
6a
6b
10a
11a
11b
10b
7
8
9

Aperture subquadrate; outer lip with strong posterior angle at periphery of body whorl and lesser angle at intersection with anterior undulant cord; interior of outer lip with about 11 straight, emergent lirae terminating before lip edge, posterior lirae entire, those in anterior half more often broken into dots and dashes; inner lip adherent, arcuate, marked by 3-4 prominent plicae near anterior end of columella and node-like prominence on parietal wall at posterior sinus; siphonal canal short, rather straight, usually bordered at interior edge by pseudo-umbilicus, hardly developed except on largest shells.

First 3 whorls of apex pink on all shells; background color of teleoconch creamy white to yellowish orange; sutural ramps strongly marked by broad, axially aligned, slightly wavy brown to black bands, as many as 20 axial bands on ramp of body whorl; peripheral nodes and ribs crossed by 3 contiguous, narrow, uninterrupted bands, each ~1 mm wide: a posterior white band at periphery, another white band slightly anterior to it, and a dark brown band between them; ribs and intercostal spaces on body whorl marked with broad, irregular blotches generally correspondent to axial bands of sutural ramp; after interruption by anterior white or yellowish undulant spiral cord, blotches continue onto base where they are crossed by 2-3 narrow, white or yellow transverse spiral bands; interior of aperture white.

Operculum blackish-brown, thick, ovo-elongate, rather narrow, with many fine, concentrically arcuate growth increments radiating from sharply tapered anterior tip. Periostracum not discerned on any specimen. Radula unknown.

Remarks. The color pattern of irregular axial bands on the sutural ramp and brown and white spiral cords at the periphery is distinctive and separates shells of this species from those of all congeners.

Reeve's type was obtained from the collection of Capt. Sir Edward Belcher, who also provided its locality. The type locality, Cargados Garajos (now Cargados Carajos), is situated 395 km northeast of Mauritius in the Indian Ocean and is also known as St. Brandon Shoals (Woodward, 1871). A comment by von Martens (1880: 245) that Indian Ocean listings all trace to Reeve's original report still seems to hold true, and a listing from "Mauritius and dependencies" by Viader (1937: 24) probably traces to the same source. No new Indian Ocean records have been forthcoming, calling to question the accuracy of the original data. Belcher had recently returned to England as commander of H.M.S. *Samarang* but had served earlier as a lieutenant on the *Blossom* and as commander of the *Sulphur*, in those capacities collecting shells in many parts of the world. He kept no labels with his collection, and the localities he provided were notoriously unreliable, as evidenced by types of several other species of Fasciolariidae from his collection (see *e.g.*, Kilburn, 1993; Petit, 2007: 91-100), so the type locality of *T. belcheri* may be incorrect. Kobelt *in* Küster & Kobelt (1873: 59) extended the range beyond the Indian Ocean by figuring a shell from Liukiu-Inseln (Okinawa) in the Lischke collection. That record has been supported by many others from Japan and particularly from Okinawa. In fact, except for Reeve's original description, we are not aware of any valid published record of the species from outside the Japanese islands.

We examined 64 specimens (32 specimens in LC; 32 in ANSP), all similar to the figured syntype in shape and markings. The specimens range from 28.0 to 56.5 mm SL (average 39.2 mm). Most lots are from various sites around Okinawa and southern Japan. Of the remaining lots, one is labeled "western Pacific," one "Indian Ocean," two are from the Northern Marianas Islands, and two, containing three typical *L. belcheri*, are labeled as from Western Australia. We are inclined to treat Western Australian records as questionable until confirmed by more material from that region.

Additionally, we are aware of 14 publications, beginning with Wilson & Gillett (1971) and continuing through Mallard & Robin (2005) that treat a completely different Western Australian species as *L. belcheri*. Marrow (1988) recognized the error and tried to correct it by illustrating true *L. belcheri* from Okinawa and assigning the Western Australian taxon to *L. polygonus*. That species is similar to but distinct from *L. polygonus* and is being described by Lyons and Snyder.

One other specimen (ANSP 422699; Fig. 6), perhaps the first true record of the species in the Philippines, is considerably darker than Japanese specimens and may represent something else. We have seen none other like it.

Most incorrect reports of *Latirus belcheri* have proved to be of *L. philberti* (Récluz) or the undescribed Western Australian species. However, three specimens from Fiji figured as *L. belcheri* by Cernohorsky (1972: 155, 156, pl. 1, fig. 6, pl. 46, figs 2, 2a), are *L. pictus*. A listing of *L. belcheri* from Fiji by García (1985: 50) is also incorrect (E. García email to WGL 8/7/2010). We surmise that the radula figured by Cernohorsky (1972: 156, text fig. 15) as that of *L. belcheri* may belong instead to *L. pictus*, so the radula of true *L. belcheri* remains unknown.

Latirus tessellatus (Récluz, 1844), *nomen dubium*
Fig. 7

Turbinella tessellata Récluz, 1844a: 48; 1844c: sp. 97 (Philippines).
Latirus (*Plicatella*) *tessellatus* (Récluz) Tapparone-Canefri, 1879: 317 (not synonym of *L. philberti*).
Latirus polygonus var. *tessellatus* Paetel, 1887: 164.
Latirus tessellatus (Rclz.) Paetel, 1887: 165 (synonym of *L. philberti*); Lyons, 1991: 181 (senior primary homonym of *Latirus tessellatus* Dall, 1890).
Latirus polygonus tessellatus (Récluz) Snyder, 2003:

163.
Non Turbinella tessellata (Récluz) Reeve, 1847: pl. 12, sp. 63 (variety of *T. philberti* 'Récluz' Reeve); *nec Turbinella philberti* var. *tessellata* (Récluz) Kobelt, 1874: 73 (variety of *philberti* (Récluz) Reeve); *nec Turbinella (Peristernia) philberti* var. *tessellata* (Récluz) Kobelt, 1876: 25 (variety of *philberti* (Récluz) Reeve); *nec Peristernia tessellata* (Récluz) Tryon, 1881: 275 (synonym of *P. philberti*) and Elera, 1896: 81 (synonym of *P. philberti*); [all = *Peristernia castanoleuca* Tapparone-Canefri, 1879, Recent, western Pacific].
Non Turbinella polygona var. *tesselata* [*sic*] Kobelt *in* Küster & Kobelt, 1874: 68, pl. 17, fig. 7 (ref. also Reeve, 1847: pl. 1, fig. 1c); *nec Turbinella polygona* var. *tessellata* (Kobelt) Kobelt *in* Küster & Kobelt, 1876: 160 (correction of 1874 misspelling); *nec Turbinella (Plicatella) polygona* var. *tessellata* (Kobelt) Kobelt, 1876: 19 (variety of *P. polygona*); *nec Latirus polygonus* var. *tessellata* [*sic*] (Kobelt) Tryon, 1881: 88; *nec Latirus tessellatus* (Kobelt) Tryon, 1881: 299, pl. 67, fig. 109 (figure after Reeve, 1847, pl. 1c) and Hidalgo, 1904: 37 (synonym of *Latirus polygonus*); *nec Latirus polygonus* (Gmelin) var. *tessellatus* (Kobelt) Paetel, 1887: 164 (Philippines; in section *Plicatella*), Melvill & Standen, 1899: 158 (Torres Straits), and Viader, 1937: 23 (Mauritius); *nec Latirus polygonus* var. ß *tessellatus* (Kobelt) Melvill, 1891: 404 (Tonga); *nec Latirus tessellatus* var. (Kobelt) Elera, 1896: 84 (Philippines); *nec Turbinella tessellata* (Kobelt, 1874, *non* Récluz, 1844) Kilburn, 1975: 599 (synonym of *L. polygonus*) and Lyons, 1991: 181 (senior primary homonym of *Latirus tessellatus* Dall, 1890); [no genus] *tessellatus* (Kobelt) Trew, 1990: 14 (name of uncertain validity, generic placement uncertain); *nec Latirus polygonus* forma *tessellatus* (Kobelt, 1876) Delsaerdt & Steppe, 1996: pl. 8, fig. 9b (Philippines); *nec Plicatella polygona* var. *tessellata* (Kobelt *in* Küster & Kobelt) Snyder, 2003: 163 (synonym of *Latirus polygonus*); *nec Latirus tessellata* [*sic*] (Kobelt *in* Küster & Kobelt, 1874) Mallard & Robin, 2005: 18 (variety of *Latirus polygonus*); [all = *Latirus polygonus* (Gmelin, 1791), Recent, Indo-west Pacific].

Type material. Unknown.

Type locality. Manila, Philippines.

Remarks. This name has been used in several ways in the literature. Reeve (1847) proposed that *Turbinella tessellata* simply represented a color form of *T. philberti*, a name he misapplied to another species. Tryon (1881) posited *tessellata* to be a synonym of *philberti* but as a species of *Peristernia*, and various authors have considered *tessellata* as a variety or form of *Latirus polygonus* (Gmelin, 1791).

The original figure of the 77-mm specimen of *T. tessellata* Récluz, although suggestive of *L. polygonus*, is not unambiguous. We illustrate a 72.8-mm specimen of *L. polygonus* from the Philippines (Fig. 8) that is similar to the Récluz figure. *Latirus polygonus* constitutes a morphologically variable species widely distributed across the tropical Indo-west Pacific from Japan to east Africa. Given the variable nature of this complex and the fact that *tessellatus* Récluz does not have priority issues with respect to Gmelin's name, it seems best to treat the name as a *nomen dubium*.

Kobelt *in* Küster & Kobelt (1874: 68) complicated matters by proposing a new name *tesselata* (corrected to *tessellata* by Kobelt *in* Küster & Kobelt, 1876: 160) for a variety of *T. polygona*, while on p. 73 following Reeve in treating *T. tessellata* Récluz as a variety of *T. philberti* (Récluz) Reeve, *i.e.*, a *Peristernia*. Kobelt (1876) maintained that distinction in his catalogue, and some subsequent authors (*e.g.*, Tryon, 1881; Kilburn, 1975) properly distinguished *tessellata* Récluz from *tessellata* Kobelt. However, *T. tessellata* Kobelt *in* Küster & Kobelt is an unavailable primary junior homonym of *T. tessellata* Récluz, 1844. Its figure (Kobelt *in* Küster & Kobelt, 1874: pl. 17, fig. 7; reproduced here as Fig. 9) reveals the junior name to represent a familiar Philippine variety of *Latirus polygonus*, suggesting that the homonyms may also prove to be subjective synonyms.

Genus ***Peristernia*** Mørch, 1852
Type species by subsequent designation (von Martens, 1868: 530): *Turbinella nassatula* Lamarck, 1822, Recent, Indo-West Pacific.

Peristernia castanoleuca Tapparone-Canefri, 1879
Figs 10, 11

Turbinella philberti (Récluz): Reeve, 1847: pl. 12, sp. 63; *non Turbinella philberti* Récluz, 1844, = *Latirus philberti*.
Turbinella tessellata (Récluz): Reeve, 1847: pl. 12, sp. 63 (variety of *T. philberti* 'Récluz' Reeve, *i.e.*, *Peristernia*).
Lathirus philberti '(Récluz)' *auct.*: Schaufuss, 1869: 34.
Turbinella philberti '(Récluz)' *auct.*: Kobelt *in* Küster & Kobelt, 1874: 72, pl. 18, figs 6, 7.
Turbinella (*Peristernia*) *philberti* '(Récluz)' *auct.*: Kobelt, 1876: 25.
Peristernia castanoleuca Tapparone-Canefri, 1879: 318; Snyder, 2003: 63; Snyder & Callomon, 2010: 32, 33, pl. 2, figs 9-11.
Peristernia philberti '(Récluz)' *auctt.*: Tryon, 1881: 79; Abbott & Dance, 1982: 182; Mallard & Robin, 2005: 21, pl. 62, figs; Robin, 2008: pl. 227, fig. 1.
Latirus castanoleucus 'Tapp. C.': Paetel 1887: 162.

Type material. Lectotype MSNG, Tapparone-Canefri type lot, 26.2 mm (Fig. 11).

Type locality. Philippine Islands (Cuming collection).

Distribution. Philippines, South China Sea, Vietnam,

Malaysia, Indonesia, Papua-New Guinea, and Queensland, Australia.

Description. Shells large for genus, to 44.9 mm SL, with about 9 whorls including protoconch. Protoconch gray-brown, tip flattened, immersed, of about 2-1/4 smooth, rounded whorls; terminus with teleconch well marked. Teleconch with up to 7 whorls, those of spire with about 8 broad axial ribs extending from suture to suture; spire moderately compressed at suture, which is somewhat collared by raised posterior edge of next anterior whorl, that edge being rendered denticulate by termini of numerous low growth ridges, edge and suture undulating in concert with axial ribs and intercostal areas; 3 equal-sized smooth spiral cords on first teleconch whorl, increasing to 4 on next whorl; anterior 2 cords larger, defining periphery and anterior half of whorls; cords crossing ribs and intercostal spaces but strongest atop ribs; by whorl 3, a smaller cord has appeared between large cords and another has appeared adjacent to anterior suture; more small cords added by intercalation to ramp on later whorls; body whorl up to 10 axial ribs extending from suture to base, 8-9 small and still smaller cords on ramp, 2 large cords separated by single smaller cord at periphery, single (rarely double) large cord at junction with base, and 4-5 smaller, subequal cords between; base short, with 4-5 subequal cords; siphonal process relatively broad, very short, truncated at tip, and crossed by about 2-6 low, transverse cords. Aperture ovo-elongate, with broad posterior sinus; outer lip slightly to very arcuate, edge crenulated by termini of spiral cords of body whorl, inside of lip with about 15-18 thin, straight emergent lirae, sometimes with small nodular swellings at tips of lirae at anterior end of aperture; inner lip arcuate, adherent, with smooth parietal wall and 1-2 low, oblique, nearly obsolete plicae at anterior end of columella; siphonal canal short, canted to left, with thin, raised inner edge defining deep prominent pseudo-umbilicus.

Apices worn, dark gray to black on all but one shell examined. Three teleoconch color forms examined: first and most common (exemplified by Reeve's figure) dark chestnut to nearly black; second form with dark chestnut replaced by reddish orange; in third form, shell surface cream to light tan, with dark color confined to a few spiral lines. Prominent cords of spire and body usually but not always white; smaller cord separating large peripheral cords usually white; low ribs on sutural ramp sometimes white, more often chestnut; one shell entirely dark chestnut brown except for a single white anterior cord on body whorl; inside of aperture pale to rich lilac on dark shells; orange and lighter tan shells with white markings varying as on darker shells, but inside of apertures always pink or white. Operculum, periostracum and radula unknown.

Remarks. We examined 99 specimens (45 in LC; others in ANSP) with sizes from 11.3 to 41.3 mm SL (average 29.6 mm) and localities ranging from southeast Asia and the Philippines to Queensland,Australia. All had been misidentified as *Peristernia philberti* (Rècluz).

This species was originally misidentified as *Turbinella philberti* Rècluz by Reeve (1847), and his illustrations were so recognizable (Fig. 10) and his work so pervasive that the name has been used for it by most workers since (*e.g.*, see synonymy above). Tryon (1881: 80) also proposed that *P. philberti* (*sensu* Reeve) might be a variety of *P. nassatula* (Lamarck, 1822), but that proposal was justifiably ignored.

When Tapparone-Canefri (1879) described *Peristernia castanoleuca*, he noted that Reeve had misidentified the species as *Turbinella philberti* Récluz, and he distinguished his species from the Récluz taxon. That classification was followed by Paetel (1887: 162-164), who included both *Latirus castanoleucus* (Tapparone-Canefri) and *L. philberti* (Rècluz) in his catalogue. Melvill (1891: 406) included *P. castanoleuca* in his catalogue, and Hidalgo (1904: 35) cited *P. castanoleuca* from several Philippines localities and served notice that this was the Philippine species that Elera (1896) had called *P. philberti*. Faustino (1928: 272, 273) reiterated Hidalgo's records and stated again that Reeve's name was a synonym. Shells of those two species are perfectly distinct where they occur sympatrically at many locations in the Philippines, yet after Faustino's catalogue the name *castanoleuca* inexplicably slipped from the lexicon for the next 75 years and was replaced by Reeve's error. Snyder (2003: 63) revived Tapparone-Canefri's classification, stating that *T. philberti* is a *Latirus* and *P. castanoleuca* is the correct name for the species that Reeve described and figured.

Acknowledgements

Yves Finet (MHNG) provided images of two specimens labeled *Turbinella philberti* in the Delessert collection, and Paul Callomon (ANSP) prepared the plate and obtained photographs of the type material of *Turbinella candelabrum*. Henry Chaney (SBMNH) sent the Shasky specimen of *L. philberti* for inspection and, with Eugene Coan, Lindsey Groves (NHMLAC), M. G. Harasewych (USNM), Elizabeth Kools (CAS), John Pearse, University of California, Santa Cruz, CA, and Karen Vander Ven, University of Pittsburg, PA, assisted in the search for Panamic *L. candelabrum*. Emilio F. García, Lafayette, LA provided distributional information and sent photographs of specimens in his collection. Richard E. Petit, North Myrtle Beach, SC provided guidance to literature, and an anonymous reviewer caught errors we had overlooked. All are gratefully thanked.

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Two new species of *Moerchia* A. Adams, 1860 (Gastropoda, Pyramidellidae) from southwest Tropical Pacific

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KEY WORDS. Pyramidellidae, *Moerchia*, Tropical south Pacific, new species.

ABSTRACT. Two new species for the genus *Moerchia* A. Adams, 1860 are described, from Solomon and Philippines Islands, in the tropical SW Pacific. Details of the shell morphology obtained by Scanning Electron Microscopy (SEM) are shown, and information about its habitat and geographic range are supplied. *Moerchia* is here placed in the family Pyramidellidae on the basis of last informations. Photos and drawings of previously known species and data on their distribution are included.

RESUMEN. Se describen dos nuevas especies del género *Moerchia* A. Adams, 1860 de las Islas Salomón y Filipinas, Pacífico Tropical Suroeste y se facilitan detalles de la morfología de sus conchas mediante fotografías al microscopio electrónico de Barrido (MEB), así como datos relativos a su hábitat y distribución geográfica. *Moerchia* es emplazado en la familia Pyramidellidae en base a los últimos hallazgos. Al mismo tiempo se muestran fotografías y dibujos de otras especies conocidas, así como datos sobre su distribución.

INTRODUCTION

A. Adams (1860) described the genus *Mörchia* as a subgenus of *Cyclostrema* and hence it was placed in the family Vitrinellidae. It should be noticed that both the spellings *Mörchia* and *Moerchia* were used by Adams but only the latter is correct under IZNC rule 32.5.2.1 (WoRMS).

Believing the taxon name published in April 1860 to be pre-occupied by "Albers, 1850", Thiele replaced it by *Morchiella*; however, Albers really published the name only in December 1860.

Later, *Moerchiella* Thiele, 1924 (non Nevill G., 1885) was also replaced by *Moerchinella* Thiele, 1931, but this replacement was also unnecessary, since *Moerchia* A. Adams is a valid name.

The genus of Albers (non A. Adams) is not correctly mentioned because it is not valid: it is applied to some land species, such as *Moerchia baudoni* (Petit, 1853) in the family **Systrophiidae** Thiele, 1926, from Guadalupe Island, in the Caribbean. This taxon is also erroneously used for *Moerchia montrouzieri* (S.M. Souverbie, 1862).

Almost at the same time, Mayer (1860) described the new genus *Moerchia* in Polichaeta: *Moerchia* Mayer, 1860: 309–310. Mörch (1861b: 147) recognized *Moerchia* Mayer, 1860 (July) as preoccupied by *Moerchia* [as *Mörchia*] A. Adams, 1860 (1 April), and replaced the former with *Burtinella*.

Cossmann (1918: 76-77) corrected the spelling of *Mörchia* to *Moerchia*, treated it as a subgenus of *Cyclostrema*, wrote a description, and noted the problem of homonymy. Cossmann believed Adams' name to be preoccupied by Albers, "1850" but not knowing if a replacement had already been proposed, wisely refrained from proposing one.

Material and Methods

The material was collected by the MNHN in different expeditions to the Pacific Tropical Expeditions.

Abbreviations

AMS: The Australian Museum, Sydney
MNHN: Muséum national d'Histoire Naturelle, Paris
NHMUK: Natural History Museum, United Kingdom, London
s: empty shell

SYSTEMATICS

Superfamily **PYRAMIDELLOIDEA** Gray, 1840
Family **PYRAMIDELLIDAE** Gray, 1840
Genus ***Moerchia*** A. Adams, 1860

Moerchia A. Adams, 1860. *Anuals and Magazine of Natural History* (3)5: 299-303.
Moerchia Martens, 1860 [ex Albers MS] [deemed to be December]. *Die Heliceen*, ed. 2: 71, type species OD *Helix concolor* Ferussac, 1822. Junior homonym of *Moerchia* A. Adams, 1860 [April] Replacement name: Zophos Gude, 1911. *Proceedings of the Malacological Society of* London 9(4): 269, type by typification of replaced species.
Moerchiella Thiele, 1924, *nomen novum* pro *Moerchia*, A. Adams, 1860 non Albers, 1860. [unnecessary replacement]
Moerchinella Thiele, 1931, *nomen novum* pro *Moerchiella* Thiele, 1924, non Nevill G., 1885. [unnecessary replacement]
Liotropica Laseron, 1958: 170 [type species (OD) *Moerchia introspecta* Hedley, 1907] (junior subjective synonym).

Type species (by monotypy): *Moerchia obvoluta* A. Adams, 1860. Recent, Japan. [*Moerchia morleti* Fischer, 1877 erroneous type designation by Cossmann, 1918].

Description: Original diagnosis in Adams (1860): "*Testa oblique ovata, late umbilicata, depressa, superne convexa, inferne plana; anfractibus subito crescentibus, ultimo dilatato ascendente alios involvente usque ad apicem. Apertura oblonga, obliqua, subhorizontalis, infra dilatata, supra angustata; peritremate continuo, incrassato*".

Fig. 1. *Moerchia* sp. Specimen showing the soft parts, 1.8 mm, Exp. Kavieng, 2014, stn KS57 (MNHN)

The soft parts are similar to other genus of Pyramidellidae: White thanslucent, two eyes very close between the tentacles; these are triangular and separated; snout bifid. Operculum ovoid, paucispiral with the nucleus subcentral.

Remarks. In spite of being originally placed in Vitrinellidae [Tornidae], recent authors (Vaught, 1989; Sasaki, 2008) considered the family placement to be uncertain. Sasaki (2008) wrote "*Moerchinella obvoluta* (A. Adams, 1860) (Fig. 2A-B) had been regarded as a vitrinellid species in the past, but the slightly heterostrophic protoconch suggested to him the possibility of it being an Heterobranchia".

The placement of *Moerchia* in Pyramidellidae were not sufficiently justified, because the light heterostrophy present in the larval shell of *Moerchia obvoluta* and other species studied not constituting reason enough. Other Heterobranchia of the superfamily Valvatoidea Gray, 1840 (families Cornirostridae, Ponder, 1990; Xylodisculidae Warén, 1992; Valvatidae O. F. Müller, 1774 and Hyalogyrinidae Warén & Bouchet 1993) show the same feature, even more strongly, but in spite of that the genus *Moerchia* has not been transferred to any of those families. Really, the protoconch of *Morchia* is not clearly heterotrophic but the teleoconch. The assignment to Pyramidelloidea by Anders Warén was based on a living specimen, examined and photographed at Panglao, Philippines, 2004. (Geiger et al., 2007: fig. 3J) (Fig. 2G). We confirm this more recently with a new observation of a different species from New Guinea (Fig. 1), photographed by P. Maestrati.

In the Conchology Inc. website there are images of a *Moerchia* coming from Mactan Island, Philippines, tagged as *Morchiella moreleti* [sic!], whose operculum is unequivocally paucispiral, which is different from the species of the family Valvatoidea, whose operculum is multispiral with a central nucleus.

The only genus in Pyramidellidae which could be similar in shell to the genus *Moerchia* is *Cyclostremella* Bush, 1897, but this has planispiral shells or with very low spire and the protoconch is clearly heterostrophic. Finally, the soft parts are very similar to the animals of *Odostomia*, *Turbonilla* or Chrysallidini which is a reason of the new placement.

Initially, only two species were known in The Register of Marine Species (WoRMS) database: *Moerchia obvoluta* A. Adams, 1860 and *Moerchia introspecta* (Hedley, 1907). But in the book by Bosch *et al.* (1995) the species *Moerchiella* [sic.] *moreleti* [sic.](P. Fischer, 1877) is mentioned. Higo *et al.* (1999) considered *M. moreleti* to be a synonym of *M. obvoluta*, but they did not give any reason for this.

In the WoRMS page, *Moerchia morleti* has been revised:
Citation: Bouchet, P. (2014). *Moerchia morleti* P. Fischer, 1877. Accessed through: World Register of Marine Species at:
http://www.marinespecies.org/aphia.php?p=taxdetails&id=754936

***Moerchia obvoluta* A. Adams, 1860**
Fig. 2A-B

Mörchia obvoluta A. Adams, 1860. *Annals and Magazine of Natural History* (3) 5: 301. [Type locality: Washington Sound, off Tsu-Sima, Straits of Korea].
Morchinella obvoluta (A. Adams, 1860): Sasaki, 2008. *Zoosymposia*, 1: 182, fig. 12H.

Type material. Holotype deposited in NHMUK (1878.1.28.195). Not examined. Best figuration: Higo *et al*. (1999) (species number: G990].

Description. Original description in A. Adams, 1860: "*M. parva, opaca, alba, ad peripherian angulata, striis incrementi confertis ornata; umbilicus patulo, ad sutura crenulato*".

Dimensions: Shell of 3.29 mm in Sasaki (2008).

Habitat. Dredged from 26 fathoms [48 meters], about ¼ mile offshore in a bottom of coarse sand and broken shells (A. Adams, 1860).

Distribution. Tsu-Sima, Takano-Sima, Straits of Korea (A. Adams, 1860); Gulf of Suez (MacAndrew, 1870). *Moerchia obvoluta* A. Adams. Two specimens. Japan.

Remarks. In the original description, A. Adams (1860) explained that the genus closely resembles *Teinostoma* but the base is not covered with a callus and the mouth is not produced. Both *Morchia* and *Teinostoma*, however, together with *Vitrinella*, are not nacreous, which would seem to associate them rather with *Adeorbis* (Tornidae) and *Cyclostrema* than with *Ethalia* among the *Umboniinae* as P. P. Carpenter believes.
The MacAndrew (1870) record for the Gulf of Suez may be considered dubious, because *M. obvoluta* has been cited from Japan and the two countries are too far apart to think that it refers to the same species.
After examining the figure in Sowerby (1866, figs 42-43) and comparing it with the figure of Sasaki (2008, fig. 12H) we consider that the differential characteristic of this species is the lack of carinae which angle the shell, which causes the periphery to be rounded.

Moerchia morleti P. Fischer, 1877
Fig. 2C

Moerchia morleti P. Fischer, 1877. *Journal de Conchyliologie*, 25: 202, pl. IV, fig. 1.

Description. Original description in P. Fischer (1877: 202): *T. minuta, depressa, albida; anfractus 4, priores oblique immersi, ultimus carinatus, ad suturam prominens, crenato-tuberculatus, medio radiatim et obsolete costulatus, ad carinam plicato-crenatus; margine dextro incrassato*. Diam. maj. 2, min. 1.6 mm.
"*Coquille petite, déprimée, blanche; 4 tours de spire; les premiers obliquement immergés; le dernier caréné, saillant près de la suture, où il est crénelé, denticulé, portant des côtes rayonnantes peu marquées à sa partie moyenne, et denticulé à la périphérie; bord droit épaissi*".

Dimensions: The holotype in MNHN (IM-2000-27396) measures 2.00 mm in maximum diameter and 1.6 mm in minimum diameter.

Habitat. Sables de fond des mers de Chine (P. Fischer, 1877); dredged at 200 m off Climaco Beach House, Mactan Island, Philippines (G. Poppe) (from the Internet).

Distribution. South China (type locality). The Philippine record in Mactan Island, tagged as *Morchiella moreleti*, in our opinion does not correspond with this taxon, and it is probably a different undescribed species (close to *Moerchia* sp. in Geiger et al., 2007).

Remarks. This species is different from *M. obvoluta* because this lacks of any spiral carena.

Moerchia introspecta Hedley, 1907
Fig. 2D-F

Moerchia introspecta Hedley, 1907. *Proc. Linn. Soc. N.S.W.* 32(3): 493, pl. 20, figs 47-49. [Type locality: 23°32'S, 151°45'E, off Masthead Island, Capricorn Group, Queensland, Australia].
Liotropica introspecta (Hedley, 1907): Laseron (1958). *Records of the Australian Museum*, 24(11): 170-171.

Type material. Type in AMS (C.19332). Examined in photography (Fig. 2F).

Description. Original description in Hedley (1907: 493-494): "*Shell small, solid, hemispherical, bluntly keeled at the base, rounded above. Colour white. Whorls four, parted by furrowed suture, rather rapidly increasing, first two descending, third tilted, fourth inflated, at first ascending then suddenly descending to the margin of the base, so that the spire projects obliquely in a cavity formed by the ascent of the body-whorl. Sculpture: the earlier whorls are smooth and glossy, the last wrinkled towards the suture and ornamented throughout by fine close radial hair-lines. Base slightly concave, the plane of the periphery continued in the aperture, a small umbilicus corresponding to the spire. Aperture horizontal-oblong, adnate to the keel, thickened externally*".

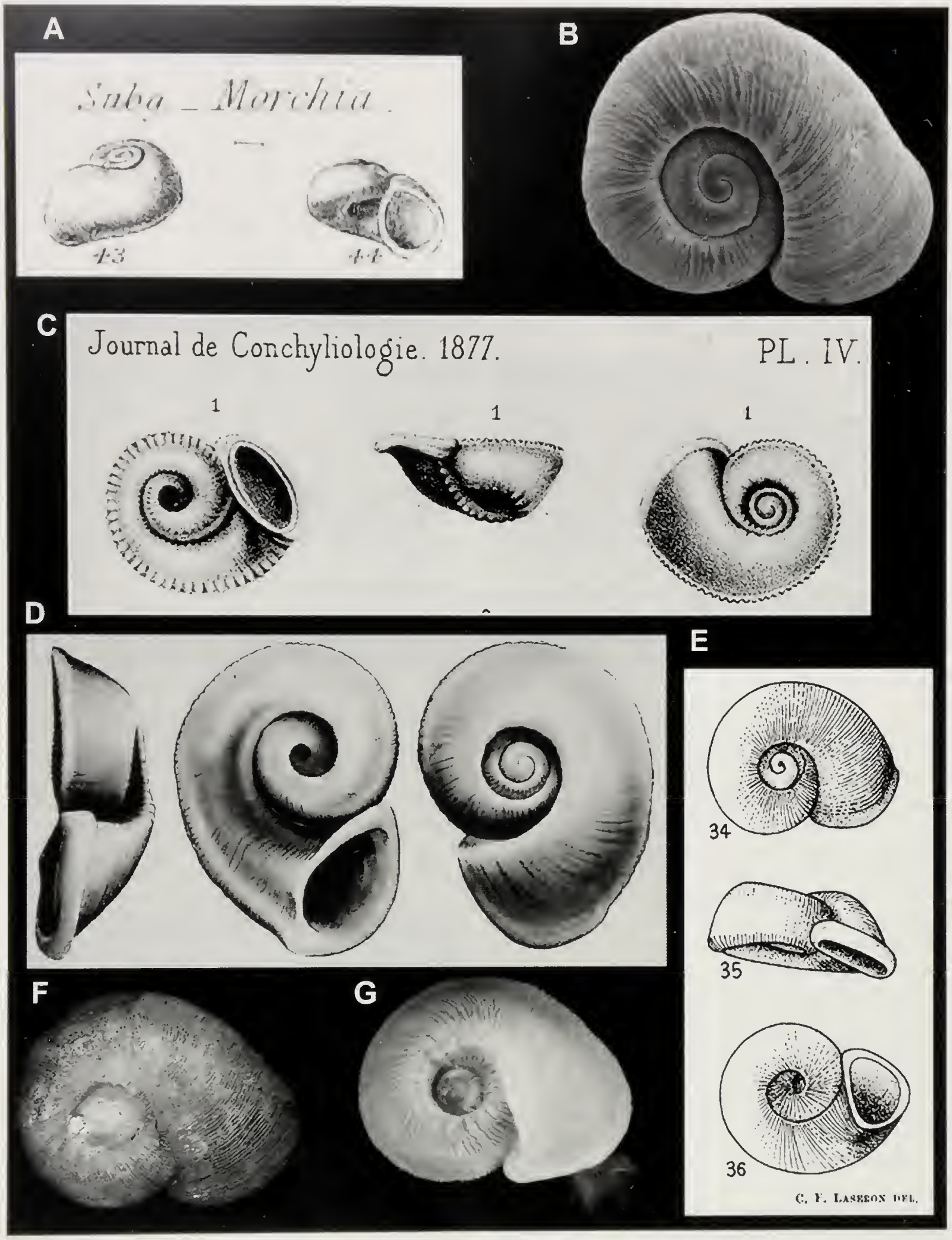

Figure 2A-G. *Moerchia* species. A-B: *Moerchia obvoluta* A. Adams, 1860: A: holotype, in G.B. Sowerby (1866, pl. 255, figs 43-44); B: shell in Sasaki (2008, fig. 12H), 3.29 mm. C: *Moerchia morleti* P. Fischer, 1877. *Journal de Conchyliologie,* 25: 202, pl. IV, fig. 1. D-F: *Moerchia introspecta* (Hedley, 1907). D: original description: 493, pl. 20, figs 47-49; E: figuration in Laseron (1958); F: type in AMS (C.19332). G: *Moerchia* sp. with soft parts, 1.8 mm, Philippines (from Geiger et al. 2007)

Dimensions: type: maximum diam. 2.25 mm; minimum diam. 1.6 mm; height 0.9 mm. Shells from Darwin are smaller: maximum diameter 1.8; minimum, 1.4 mm.

Habitat. This species is common in 31-36 m (Hedley, 1907).

Distribution. Australia, around Masthead Island, Queensland (Hedley, 1907) and Darwin (Laseron, 1958).

Remarks. Hedley (1907) says: "The Chinese *M. moreleti* Fischer, 1877 closely resembles it, but, judging from literature, differs in sculpture, and especially by the denticulate periphery".

Moerchia perforata spec. nov.
Figs 3A-G, 4A-E

Type material. Holotype (MNHN IM-2000-27245, s, Fig. 3A-C) (Stn. DW1762) and one paratype (Stn. DW1781) also in MNHN (IM-2000-27246, s, Fig. 3D).

Type locality. Solomon Islands: Stn. DW1762, 8°40'S - 160°04'E, 396-411 m [SALOMON 1].

Material examined. (6 s): Solomon Islands: 1 s, Exp. SALOMON I, Stn. DW1762, 8°40'S - 160°04'E, 396-411 m (holotype); 1 s, Exp. SALOMON I, Stn. DW1781, 1036-1138 m (paratype). Philippines: 2 s, Panglao, Bolod, PANGLAO 2004, Stn. T4, 9°33.0'N – 123°48.5'E (MNHN); 2 s, Bohol, Cortes, Stn. G1, 9°11.9'N - 123°49.5'E, 100 m (MNHN).

Description. Shell very small, solid, crushed, spire formed by just 2 ½ whorls, with a perforated surface, very wide umbilicus and a mouth in basal position.
Protoconch with little more than one smooth whorl, although its end is not clearly observable; slightly heterostrophic, measuring between 300-320 μm and situated at a lower level than the rest of the shell. The nucleus has a diameter of about 90 μm. Teleoconch with over 1 ½ whorls, ornamented with 3 carinae with small nodules which angled the shell and fine axial lines that are distributed across its surface; of the three carinae, one is subsutural and the other two delimiting the periphery, the basal carina is the most prominent. The periphery is straight or slightly concave, and so is the base.
The last half whorl crosses over the previous one, then leans toward the base. Aperture oval, located in a basal position, continuous, with a very thick peristome. Very wide umbilicus that allows seeing the previous whorls, delimited by fine nodules; just inside fine growth lines can be observed.
Dimensions: the holotype is 1.5 mm in diameter; the paratype measures 1.23 mm in maximum diameter.

Habitat. Bathyal species dredged between 396-411 m and between 1036-1138 m.

Distribution. Only known from Solomon Islands (its type locality) and the Philippines.

Remarks. *Moerchia perforata* spec. nov. can be separated from the other known species by the presence of three nodulous carinae which angle the shell and its surface is covered by numerous pits (micro-perforations).
Due the large distance between its collecting points, the shells from Philippines and Solomon could be different species, but we have not established enough morphological differences to confirm this point and hence prefer to keep them as conspecific.

Etymology. The name alludes to the surface of the shell, which is covered by very small pits (micro-perforations).

Moerchia deformata spec. nov.
Fig. 5A-E

Type material. Holotype in MNHN (IM-2000-27247, s) (Fig. 5A-C).

Type locality. Solomon Islands, Exp. SALOMON I, Stn. DW1767, 8°19'S – 160140'E, 98-200 m.

Description. Shell very small, solid, crushed, spire formed by 2 ¾ whorls, carinate and widely umbilicated. Protoconch with one whorl, a nucleus of about 160 μm, and a diameter which could be about 400 μm (with doubts due the presence of various scars being not clear which is that of the end of the protoconch); this protoconch is bulbous and slightly heterostrophic, located at a lower level than the rest of the shell. Teleoconch with 2 whorls and 2 carinae which angled the shell and are ornamented by fine axial ribs, more marked on the base, forking near the suture.
In the subsutural area of the last whorl the shell is elevated, forming a marked carina which angles it, its margin being not denticulate or crenulate; a second carina, located at the base of the periphery, is less robust than the subsutural one but more prominent, and its margin is denticulate. There is no cord or periumbilical carina. The shell is dorsally convex and basally concave. Umbilicus very large, inside only thick axial lines are visible. Aperture oval, very thick, basally oriented.

Dimensions: The holotype measures 1.93 mm in diameter.

Habitat. Species dredged in circalitoral deep bottom, between 98-200 m.

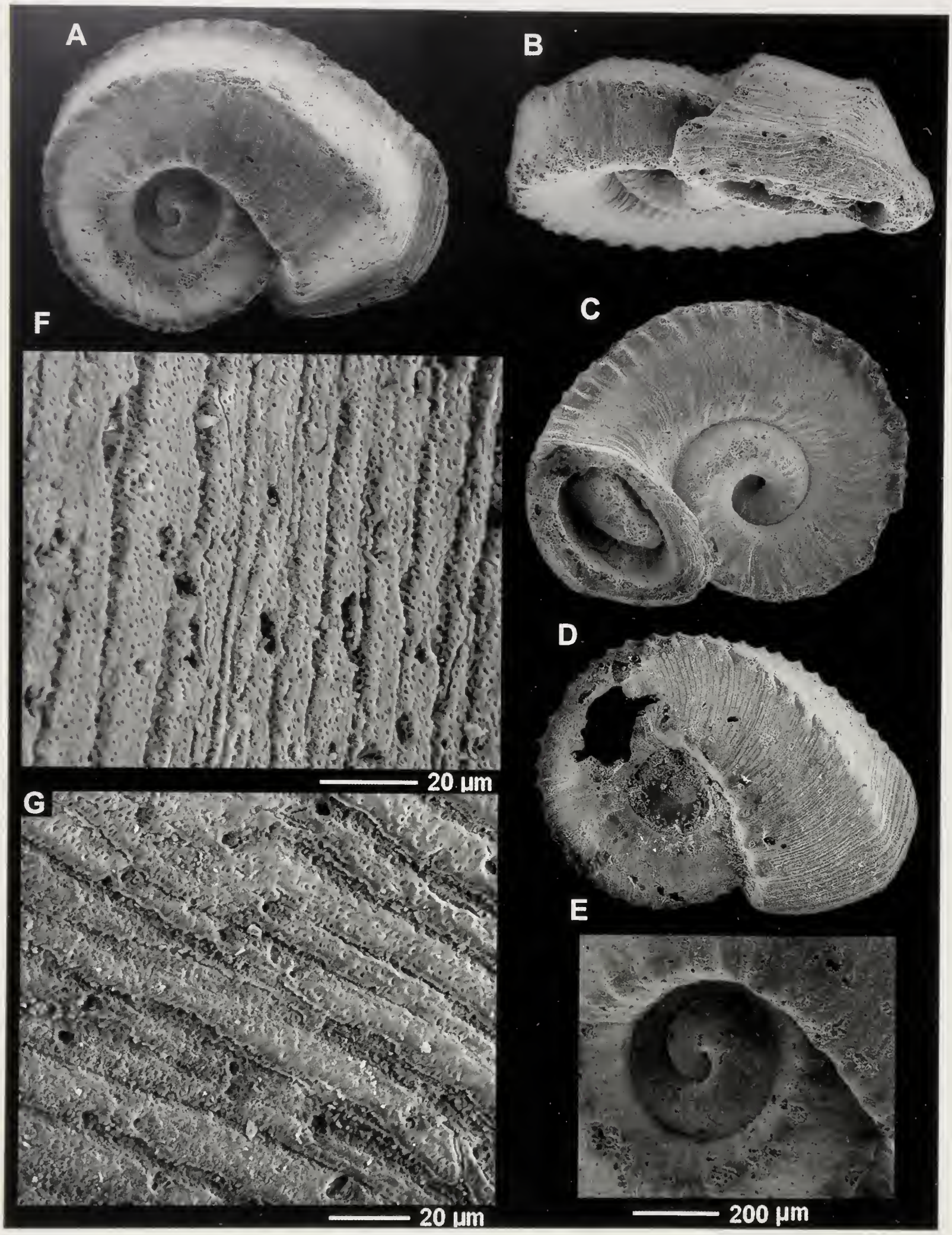

Figure 3A-G. *Moerchia perforata* spec. nov. A-C: holotype, 1.5 mm, Stn. DW1762 (MNHN); D: paratype, 1.23 mm, Stn. DW1781 (MNHN); E: protoconch; F-G: microsculpture. All from Solomon Islands

Distribution. Only known from Solomon Islands, the type locality.

Remarks. *Moerchia deformata* spec. nov. is a little similar to *M. morleti*, from which it differs by the following characters:

1-*Moerchia deformata* has a subsutural carina which is not crenulated or clearly denticulate, in opposition to that of *M. morleti*;
2- In *M. deformata*, the axial ribs are very marked on the entire shell, especially on the base, while in the description of *M. morleti* is said that "*medio radiatim et obsolete costulatus*".
3- There are no data about the size of the protoconch, but that of *M. deformata* spec. nov. is relatively larger compared to the size of the shell and in comparison with that of the drawing of *M. morleti*.
4- The drawings of the type of *M. morleti* show a shell with a little more of 3 whorls for a maximum diameter of 2 mm; the holotype of *M. deformata* has 2 ¾ whorls for a similar size.
5- *M. morleti* present the external border clearly denticulate, and it is possible to count on the last whorl 41 prominences in the Fig. 2C (in fig. 1-left) and 57 (in fig. 1 right). The holotype of *M. deformata* has the prominences on the peripheral carina very small and its number is about 86.

Another point that may be important to establish *M. deformata* spec. nov. and *M. morleti* as two different species is the enormous distance that separates them. *M. morleti* is quoted from South China, while *M. deformata* spec. nov. comes from the Solomon Islands.
Moerchia deformata differs from *M. perforata* by lacking the peripheral carina and by the larger size of its protoconch, and the different microsculpture.

Etymology. The specific name alludes to the irregular coiling of the shell.

ACKNOWLEDGEMENTS

The authors thank Philippe Bouchet for the loan of the material, and the staff from the MNHN (Department of Malacology) for their help and the study of the material collected in numerous expeditions; and also to Jesús Méndez and Inés Pazos for the SEM photographs made in the Centro de Apoyo Científico y Tecnológico a la Investigación (CACTI) of the University of Vigo. António A. Monteiro made the English revision. We thanks also an anonymous referee for the useful notes and advice.

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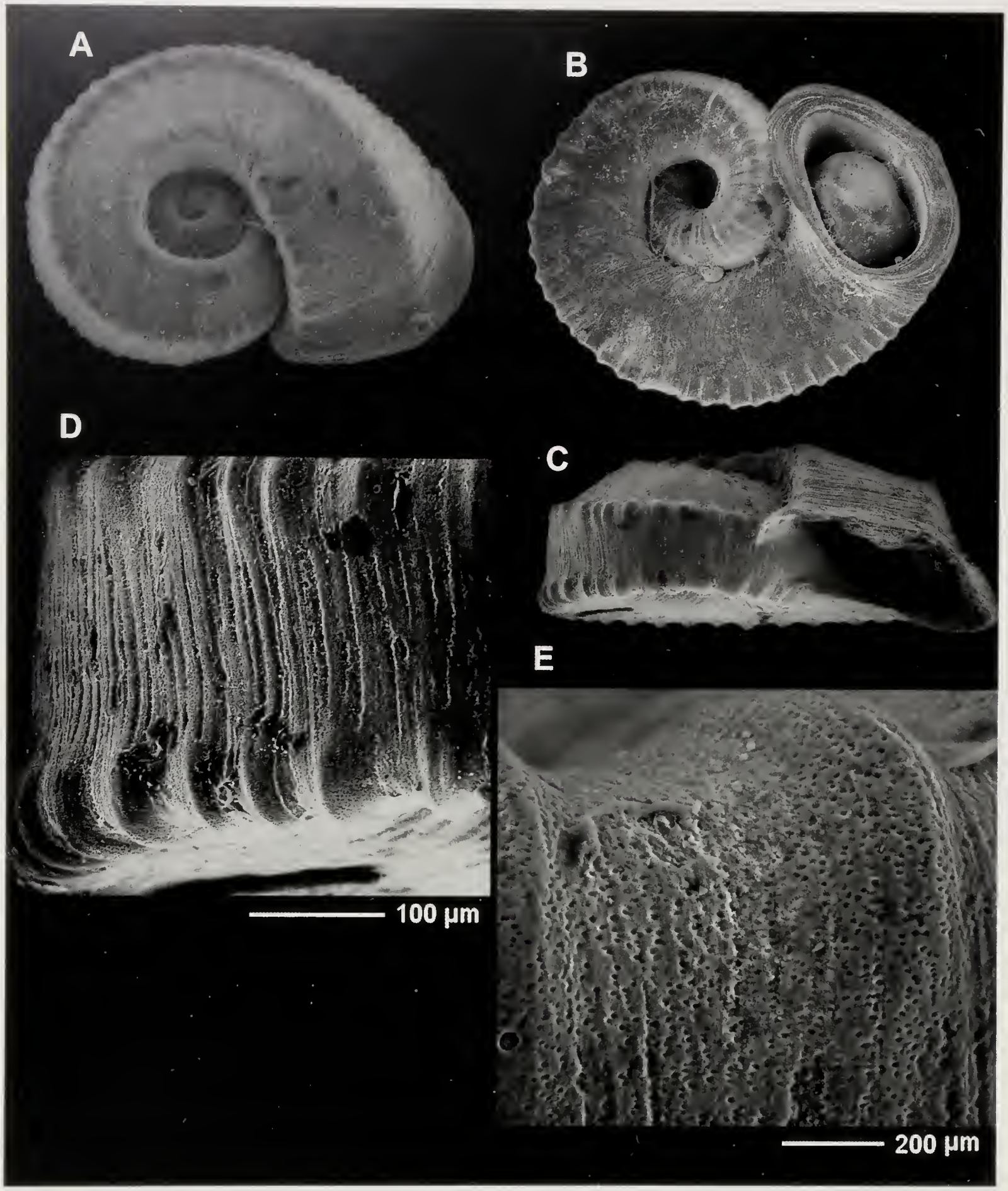

Figure 4A-E. *Moerchia perforata* spec. nov. A-B: shell, 1.27 mm, Philippines, Bohol, Cortes, Stn. G1, 100 m; C: shell, 1.4 mm, Philippines Panglao, Bolod, Stn. T4, 82 m; D-E: microsculpture

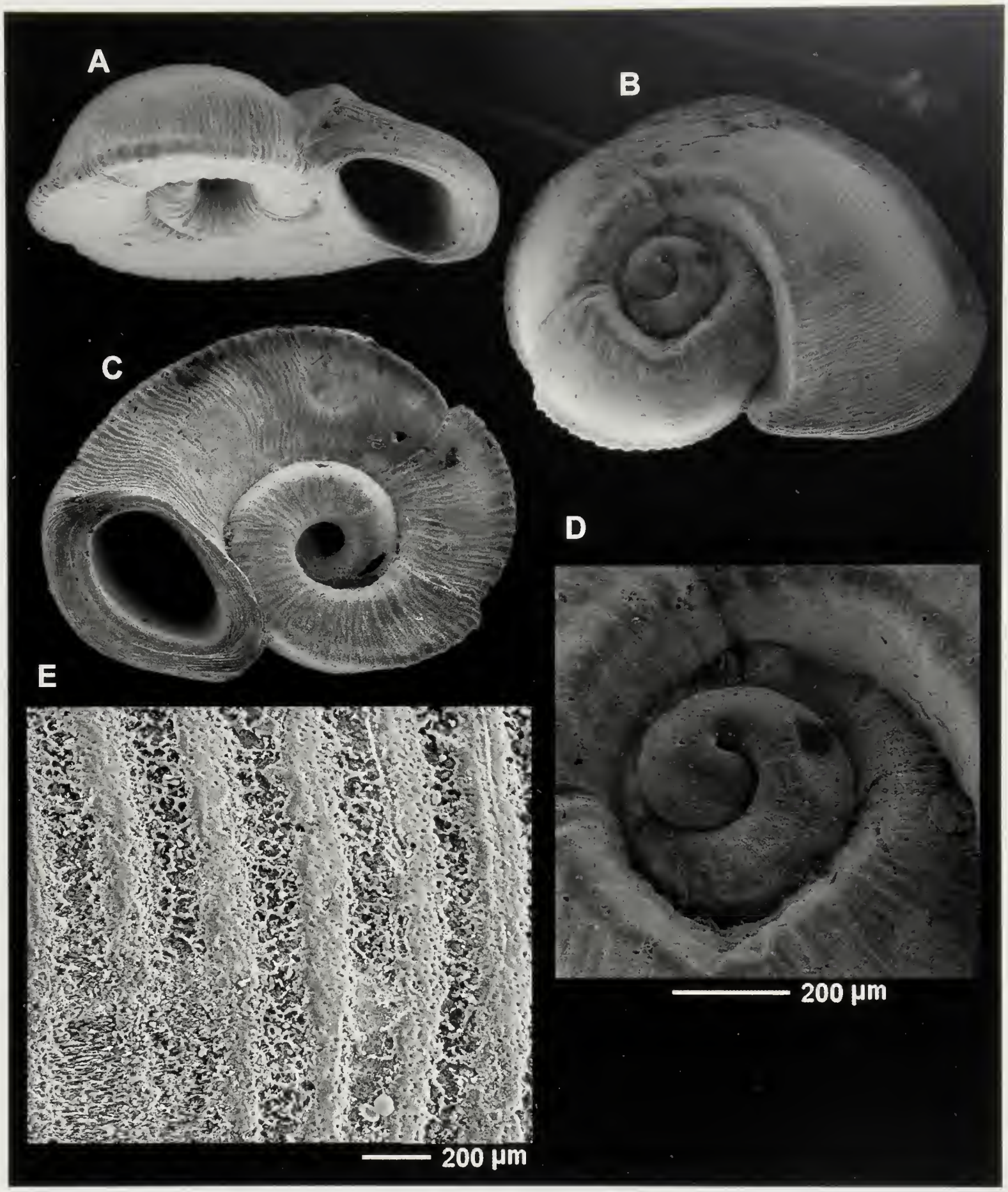

Figure 5A-E. *Moerchia deformata* spec. nov. A-C: holotype, 1.93 mm, Solomon Islands, Stn. DW1767, 98-200 m (MNHN); D: protoconch of the holotype; E: microsculpture

Description of a new species of the genus *Cinguloterebra* Oyama, 1961 (Gastropoda: Terebridae) from the Philippines

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KEYWORDS. Gastropoda, Prosobranchia. Terebridae, Philippines Island, *Cinguloterebra binii*, new species.

ABSTRACT. *Cinguloterebra binii* sp. nov. from the Philippines, is described and compared with *Cinguloterebra mariesi* E. A. Smith, 1880, *C. adamsi* E. A. Smith, 1873, *C. caddey* Bratcher & Cernohorsky, 1982 and *C. russetae* Garrard, 1976.

INTRODUCTION

Four terebrids, caught by tangle nets between 140 and 160 m deep in fine sand and mud bottom, off south-west Bohol Is, Philippines, were sent to me for determination. The shells were clearly *Cinguloterebra* Oyama, 1961, therefore I started to compare them with other species of the genus, mainly with the more similar ones. It was necessary to consult several publications and books to complete this paper, namely: E.A.Smith (1873), E.A.Smith (1880), Oyama (1961), Garrard (1976) and Bratcher & Cernohorsky (1982). An extensive comparative study of the species with other similar species of the same genus, although three specimens were lacking some parts, convinced me that it belonged to a new species.

Abbreviations

AMS: Australian Museum, Sydney, Australia.
Coll. U. Aubry: Collection Umberto Aubry.
LACM: Los Angeles County Museum, LA, CA, USA.
MCST: Museo Civico delle Scienza e della Tecnica,Villa Cappelletti, Loc. Garavelle 06012 Città di Castello (Pg) Italia.
NHMUK: Natural History Museum, London, UK.
MNHN : Muséum national d'Histoire naturelle, Paris, France.
RBINS: Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

SYSTEMATICS

Superfamily **CONOIDEA** Rafinesque, 1815
Family **TEREBRIDAE** Mörch, 1852
Genus ***Cinguloterebra*** Oyama, 1961
Type species: *Terebra hedleyana* Pilsbry, 1905, by original designation, Western Pacific.

Cinguloterebra binii sp. nov.
Figs 1-5

Type material. Holotype: 48 mm x 8mm, MCST, Paratype 1: 47.3 mm. x 7.8 mm, RBINS IG32651/MT 3027; paratype 2: 45.5 mm. x 7.5 mm, MNHN IM-2012-2712; paratype 3: 43.5 mm. x 7.4 mm, coll. U. Aubry, Piano di Sorrento (NA).

Type locality. South-West Bohol Is: Philippines, by tangle nets in 140-160 m.

Habitat. Sand-mud bottom.

Distribution. Currently only known from the type locality.

Description. Shell solid. Three specimens were incomplete in lacking subapical whorls. The holotype examination and the virtual reconstruction of the lacking whorls, by calculating the apical angle, give the shells dimensions: between 45mm and 48 mm in length and about 8mm in width. The holotype protoconch has 2.5 whorls. The holotype and the reconstructed specimens have 17 straight shaped teleoconch whorls; the body whorl is lightly convex. The sutural groove is deep and clearly marked; the subsutural groove is barely apparent. They delimit a subsutural band formed by pearly white, round nodules set in two rows separated by a shallow groove. The nodules of proximal row are bigger than the ones of the distal row. From the latter ones depart small axial ribs, more evident in the first whorls, that cross longitudinally the entire spire and, fading, link up with the proximal nodules of the below subsutural band. These ribs are crossed by delicate spiral rows that become more evident in the third inferior part of the body whorl. Basic colour is light brown to dark brown, more marked in the apical whorls, giving the shell a quite particular chromatic feature. Aperture quadrate with a thin outer lip.

Remarks. *Cinguloterebra binii* sp. nov is particularly similar only to *C. caddey* Bratcher & Cernohorsky, 1982 (Figs 7-8), *C. adamsi* E. A. Smith, 1873 (Figs 9-10), *C. mariesi* E. A. Smith, 1880 (Figs 11-12) *and C. russetae* Garrard, 1976 (Figs 13-14).
All these species, especially *Cinguloterebra caddey* and *C. russetae*, offer different characters about

development of whorls, in particular the last one (lenght/width ratio of the body whorl); The sculpture and the colour pattern too easily distinguish them from the new species.
When compared side-by-side (Figs 1-14), the differences between these species and *Cinguloterebra binii* sp. nov. are obvious.

Derivatio nominis. This shell is dedicated to Gianluigi Bini who for some years now has dedicated great part of his time with passion and competence to the study of malacology

ACKNOWLEDGEMENTS

I am very grateful to Gianluigi Bini for the loan of the material, to Salvatore Russo for his comments on the manuscript and Miss Rosa Gargiulo for her prompt and professional assistance.

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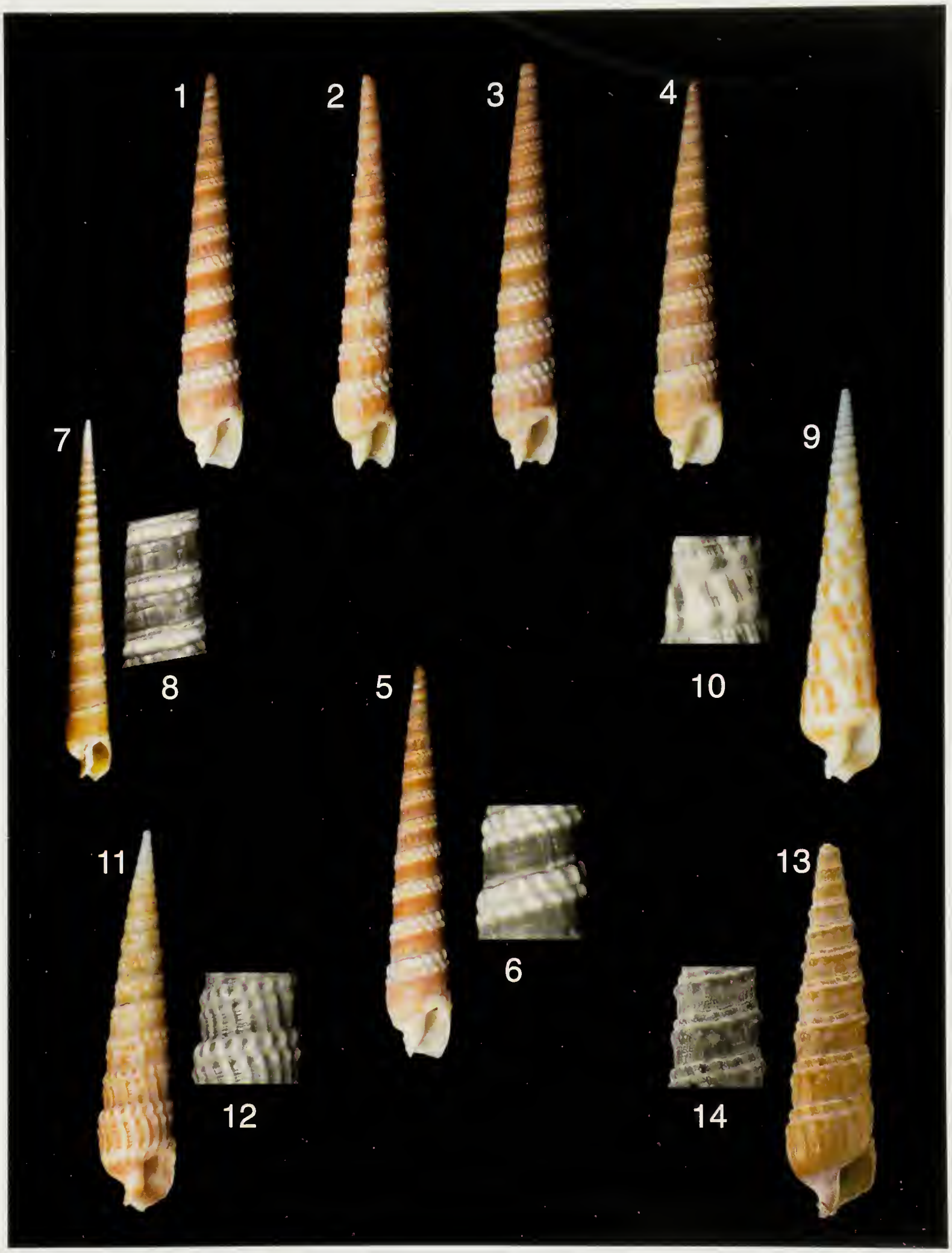
Figures 1- 14

1-4. *Cinguloterebra binii* sp. nov., 140-160 m, Bohol Is, Philippines:
1. Holotype, MCST, 48.0 mm. **2.** Paratype 1, coll. U. Aubry, 45,3 mm. **3.** Paratype 2, coll. U. Aubry, 45,5 mm..
4. Paratype 3, coll. U. Aubry, 43,5 mm.
5-14. Comparative Material: **5.** *Cinguloterebra bini* sp-nov, holotype, MCST, 48.0 mm; **6.** Detail of midwhorls (not scaled); **7.** *Cinguloterebra caddey* Bratcher & Cernohorsky, 1982, holotype LACM n.1257, Honolulu Hawaii, 42.0 mm; **8.** Detail of midwhorls (not scaled). **9.** *Cinguloterebra adamsi* E.A. Smith, 1873, lectotype NHMUK 1979132, Bohol Is, Philippines, 59.0mm; **10.** Detail of midwhorls (not scaled); **11.** *Cinguloterebra mariesi* E.A. Smith, 1880, holotype NHMUK 1880.3.1.94, Japan, 43.0mm; **12.** Detail of midwhorls (not scaled); **13.** *Cinguloterebra russetae* Garrard, 1976, holotype AMS C 102587, N.W. Australia, 29.0mm; **14.** Detail of midwhorls (not scaled).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On the identity of *Favartia peasei* (Tryon, 1880) (new name for *Murex foveolatus* Pease, 1869 *non* Hinds, 1844) (Gastropoda : Muricidae : Muricopsinae)

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ABSTRACT. The lectotype of *Murex foveolatus* Pease, 1969 (*non* Hinds, 1844), now *Favartia peasei* (Tryon, 1880), in the ANSP is compared with the originally illustrated paralectotype discovered afterwards in the MCZ, and with other specimens and species. The type locality is corrected.

INTRODUCTION

Working on a group of *Favartia* species occuring in the Indo-West Pacific and having been puzzled as to the identity and the variability of shell characters in *Favartia peasei* (Tryon, 1880), we decided to compare a few species of this group of *Favartia* that have broad axial varices and a high spire, in order to verify the conspecificity of the lectotype of *M. foveolatus* in the ANSP, designated by Myers & D'Attilio (1989), with the paralectotypes later discovered in the MCZ (Vokes, 1995).

Abbreviations

ANSP : The Academy of Natural Sciences of Drexel University, Philadelphia, USA.
EPHE : Ecole Pratique des Hautes Etudes, Perpignan, France.
MB : Michel Boutet, Papara, Tahiti.
MCZ : Museum of Comparative Zoology, Harvard University, Cambridge, U.S.A.
RH : Collection of Roland Houart.

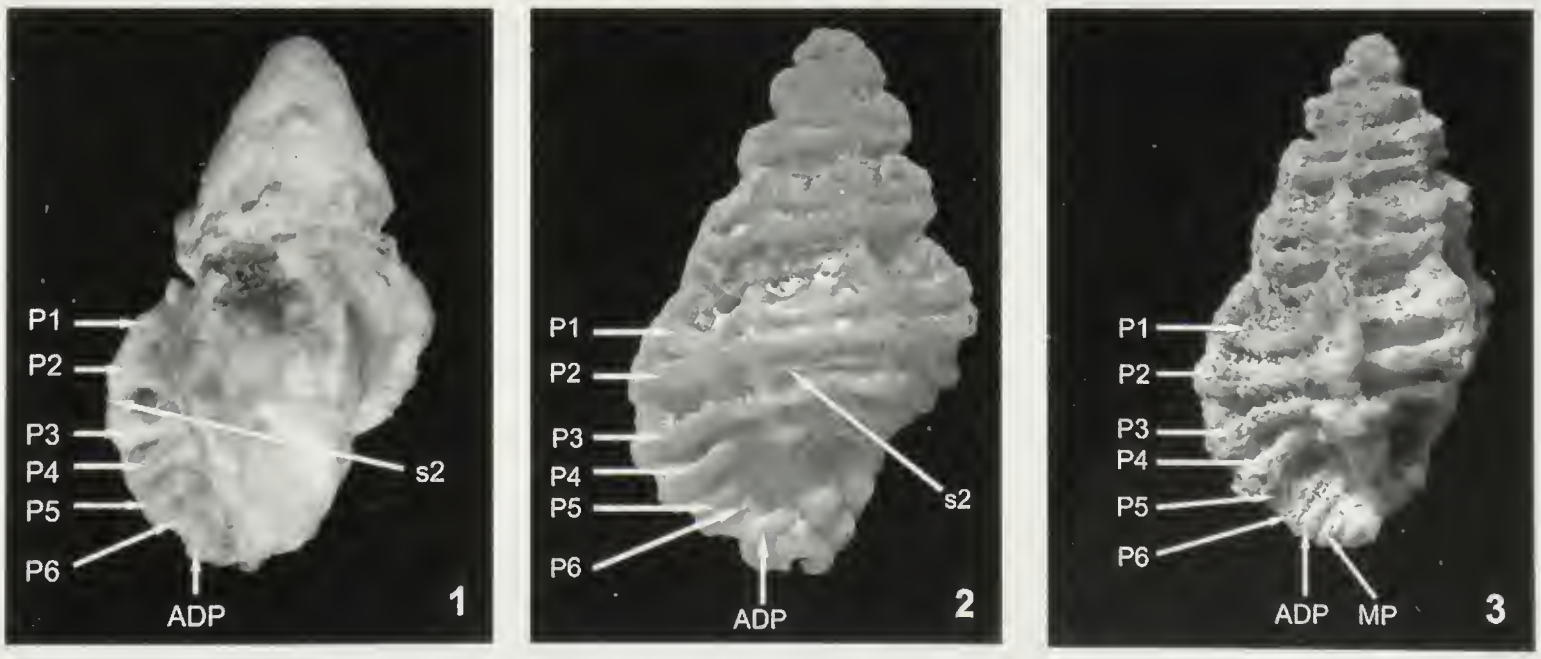


Fig. 1. *Favartia peasei* (Tryon, 1880), lectotype of *Murex foveolatus* Pease, 1869, 12.6 mm, ANSP 36144.
Fig. 2. *Favartia peasei* (Tryon, 1880), Afaahiti, Tahiti, 15.5 mm, RH.
Fig. 3. *Favartia ponderi* Myers & D'Attilio, 1995, Rabaul, Papua New Guinea, 13.8 mm, RH.

Figures 1-3. Terminology used to describe the spiral cords (after Merle, 1999 and 2001).

P: primary cord; **s:** secondary cord; **P1:** shoulder cord; **P2-P6:** primary cords of the convex part of the teleoconch whorl; **s1-s6:** secondary cords of the convex part of the teleoconch whorl (example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.); **ADP:** adapertural primary cord on the siphonal canal; **MP:** median primary cord on the siphonal canal.

Favartia (*Favartia*) *peasei* (Tryon, 1880)

Figs 1, 2, 4G-N

Murex foveolatus Pease, 1869 : 83, pl. 8, fig. 3 (*non* Hinds, 1844).
Murex peasei Tryon, 1880 : 129, pl. 38, fig. 462 (*n. n.* for *Murex foveolatus* Pease, 1869 *non* Hinds, 1844).

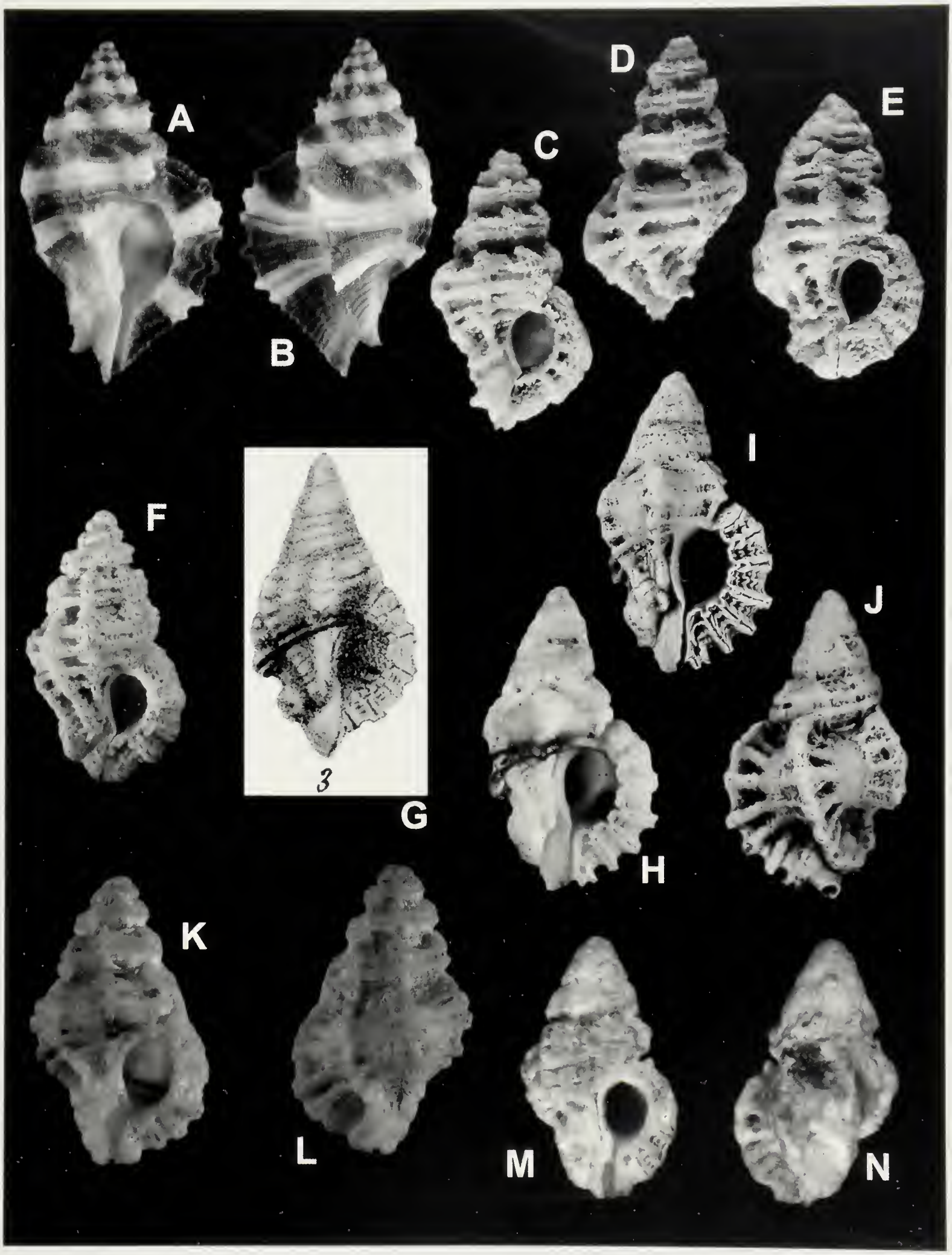
Type locality. La Paz, Baja California, Mexico (erroneous – see below). Following recommendation 76A.2.A of ICZN (1999) "A statement of a type locality that is found to be erroneous should be corrected", the type locality of *Murex foveolatus* Pease, 1869 is here corrected to Tahiti, French Polynesia.

Distribution. Tahiti, Society Archipelago, French Polynesia. The conspecificity of the specimens from the Western Indian Ocean (Houart et al., 2011) still needs to be verified.

Remarks. *Favartia peasei* has a complicated history. It was introduced as a new name for *Murex foveolatus* Pease, 1869 *non M. foveolatus* Hinds, 1844, which is actually a member of the Ocenebrinae from California.
Pease (1869: 83, pl. 8, fig. 3) described *M. foveolatus* from "*La Paz, in sinu Californica*" along with a drawing of the shell (Fig. 4G). The type locality is undoubtedly erroneous, Pease having probably received false information or mixed the specimens.
After his description was published, Pease sent a specimen of *M. foveolatus* to Tryon, who recognized the homonymy with *M. foveolatus* Hinds, 1844. Tryon (1880) then renamed it *Murex peasei*.
The shell was wrongly identified by Keen (1971: 532), who illustrated a species as *Favartia peasei* and cited it as occurring along the west coast of Mexico and Panama. This species was later named *Favartia poormani* Radwin & D'Attilio, 1976, and is now included in the subgenus *Pygmaepterys* Vokes, 1978 (Fig. 4A-B).
Vokes (1984) was the first to include *F. poormani* in *Pygmaepterys*, but she thought the original figure of *Murex foveolatus* represented *F. poormani* and that the specimen sent afterwards to Tryon by Pease was another species. Vokes thus considered *F. poormani* to be an unnecessary name.
Cernorhorsky (1985) illustrated the shell sent to Tryon by Pease and deposited in the ANSP.
This specimen was designated as the lectotype of *Murex foveolatus* Pease, 1869 by Myers & D'Attilio (1989). There was no locality on the label (see Radwin & D'Attilio, 1976: 152). It is not the originally illustrated specimen, but as stated by Vokes (1995: 18) and following ICZN (1985) [Art. 74 (a)] "any author may designate one of the syntypes as the lectotype" [now (1999): Art. 74(1)]: "A lectotype may be designated from syntypes to become the unique bearer of the name of a nominal species-group taxon and the standard for its application". Because it is clear that the specimen sent by Pease himself was one of the original type lot, this designation is thus valid.
In her well-documented and illustrated article, Vokes (1995) wrote about her unexpected discovery of the originally illustrated specimen of *Murex foveolatus*, together with a second, smaller one, in the Museum of Comparative Zoology, Harvard University (Fig. 4H-J). Both were illustrated by Vokes (1995: 18, figs 2 and 4).
Myers (2003) also commented on *F. peasei*. She illustrated the original drawing of Pease and the lectotype, but the distribution of the species was still unknown.
A specimen in the RH collection, from Tahiti (Figs 2, 4K-L), is similar to the shell originally figured by Pease (1868) (Fig. 4G) and thereafter illustrated by Vokes (1995) (Fig. 4H-J). It only has one additional axial varix on the last teleoconch whorl (6 vs 5 in the paralectotype), but this is a normal variation in *Favartia* species. The shell in the RH collection has also some dark brown blotches on P3, between s2 and P3 and between P3 and P4, almost forming a brown band as observed in the MCZ paralectotype.

Figure 4

A-B. *Favartia* (*Pygmaepterys*) *poormani* Radwin & D'Attilio, 1976. Chiriqui Bay, West Panama, 21.5 mm, RH.
C-F. *Favartia* (*Favartia*) *ponderi* Myers & D'Attilio, 1989
C-D. Mactan Is, Philippines, 14 mm, RH; **E-F.** Rabaul, Papua New Guinea. E. 15.6 mm; F. 13.8 mm, RH.
G-N. *Favartia* (*Favartia*) *peasei* (Tryon, 1880)
G. Original figure of *Murex foveolatus* Pease, 1869 (*American Journal of Conchology*, vol. 5, pl. 8, fig. 3); **H-J.** Paralectotype of *Murex peasei*, MCZ 304068A, 16 mm (I-J: shell whitened to show detail of sculpture); (photos courtesy E.H. Vokes, scan of black and white photographs); **K-L.** French Polynesia, Afaahiti, 17°43'60" S et 149°18'0" W, Tahiti, 15.5 mm, RH; **M-N.** Lectotype of *Murex peasei*, ANSP 36144, 12.6 mm.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We also compared *F. peasei* with more or less similar looking species from the Indo-West Pacific such as *Favartia brevispira* Bozzetti, 2007, *F. dorothyae* Emerson & D'Attilio, 1979, *F. garretti* (Pease, 1868), *F. maculata* (Reeve, 1845), *F. nucula* (Reeve, 1845), *F. ponderi* Myers & D'Attilio, 1995, *F. striasquamosa* (Ponder, 1972) and *F. sykesi* (Preston, 1904). None except *F. ponderi* seems to be close enough to enter into the variability of the shell morphology of *F. peasei*.

However, *Favartia ponderi* (Figs 3, 4C-F) differs in having a different spiral sculpture morphology, and a final teleoconch whorl with four strong primary spiral cords P1-P4, followed by small, almost or entirely obsolete P5 and P6. This compares to the broad P1-P5 followed by a narrower P6, with an occasional s2 between P2 and P3 in *F. peasei* (Figs 1-3).

The specimen in the EPHE collection identified as *Favartia ponderi* Myers & D'Attilio, 1989 by Tröndlé & Houart (1992: 83, fig. 34) turns out to be probably conspecific with *F. peasei* and not with *F. ponderi* as mentioned.

After the comparison of the worn, much encrusted and slightly smaller lectotype in the ANSP (Figs 1, 4M-N), with the photos of the MCZ paralectotypes and a specimen from Tahiti (Figs 2, 4K-L), we conclude that both the lectotype and the paralectotypes of *F. peasei* are conspecific and differ from the other species cited above.

ACKNOWLEDGEMENTS

We are grateful to Emily H. Vokes (Professor Emeritus, Tulane University) for the permission to use her photographs.

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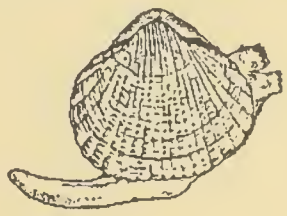

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Claude VILVENS

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SAMEDI 8 NOVEMBRE 2014

Visite ou conférence ?

Nous caressons un projet de visite d'un haut lieu de la malacologie mais, au moment de mettre sous presse, nous ne savons pas si nos démarches vont aboutir. De toute manière, si tel n'était pas le cas, une conférence sera proposée à nos membres. Rendez-vous sur notre site Web (http://www.societe-belge-de-malacologie.be/ - onglet réunions) pour suivre l'évolution du projet.

***

SAMEDI 13 DECEMBRE 2014

Christiane DELONGUEVILLE et Roland SCAILLET: Islande: Terre et Mer Vivantes

L'Islande, une île en perpétuelle évolution géologique à l'échelle humaine, allie la force tellurique à la beauté de ses paysages et à la richesse de sa faune malacologique marine. Tel est le programme proposé : passer du feu de sa terre à la fraîcheur de ses mers, du bord de la côte jusqu'aux eaux profondes qui la bordent.

***

Pour rappel : Pause traditionnelle en janvier. Première réunion de 2015 en février !

Novapex/Société : la publication généraliste de la SBM

Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

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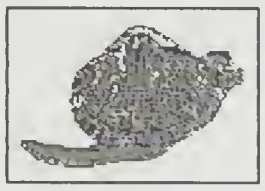

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Haliella stenostoma (Jeffreys, 1858) - Eulimidae - dans la cavité gastrique de *Scaphander lignarius* (Linnaeus, 1758) - Scaphandridae Récolte en Islande

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MOTS CLEFS *Scaphander lignarius* - Scaphandridae - Biologie et habitudes alimentaires - *Haliella stenostoma* - Eulimidae - Islande.

KEY WORDS *Scaphander lignarius* - Scaphandridae - Biology and feeding habits - *Haliella stenostoma* - Eulimidae - Iceland.

RESUMÉ

L'analyse du contenu du bol alimentaire d'un spécimen de *Scaphander lignarius* (Linnaeus, 1758) - opisthobranche benthique - provenant d'Islande a conduit à la collecte d'un spécimen operculé d'Eulimidae d'eaux profondes relativement peu commun : *Haliella stenostoma* (Jeffreys, 1858).

ABSTRACT

The content analysis of the bolus of a specimen of *Scaphander lignarius* (Linnaeus, 1758) - benthic opisthobranch - from Iceland led to the collection of an operculated specimen of a relatively uncommon deep water species of Eulimidae : *Haliella stenostoma* (Jeffreys, 1858).

INTRODUCTION

Scaphander lignarius (Linnaeus, 1758) (Fig. 1 - 4) est un opisthobranche (Scaphandridae) vivant sur les fonds sablo-vaseux de l'étage infralittoral jusqu'à ceux de la partie supérieure du talus continental. On signale sa présence jusqu'à 700 mètres de profondeur. On le trouve en Atlantique Nord-Est (Islande - Féroé - Shetland - Lofoten - Iles Britanniques - Mer du Nord - Golfe de Gascogne), au sud jusque dans les archipels de Madère et des Canaries et en Méditerranée. La coquille est ovale, rétrécie à l'apex. L'ouverture très large occupe toute la hauteur du test. Sa surface, de couleur brun-jaunâtre striée de blanc, est parcourue de délicates stries spirales creusées de petites cavités, que croisent de fines stries longitudinales (Fig. 4). L'animal (12 à 15 cm) est plus grand que la coquille (jusqu'à 5 à 6 cm) dans laquelle il ne se rétracte pas entièrement. C'est un prédateur carnivore qui évolue sur le fond meuble ou enfoncé jusqu'à 5 cm dans le sédiment. Il ingère une nourriture très éclectique : foraminifères, annélides, échinodermes, crustacés et mollusques. Les animaux sont ingérés en entier, parties dures comprises. La partie antérieure du tube digestif de l'animal traverse un complexe de trois plaques calcaires (sorte de gésier) (Fig. 3) entre lesquelles les proies sont broyées et les substances nutritives récupérées (Thompson 1976 - Eilertsen & Malaquias 2013).

Haliella stenostoma (Jeffreys, 1858) (Fig. 5-6) est un Eulimidae d'eau profonde vivant sur les fonds de la partie supérieure du talus continental. L'espèce est probablement associée à des Ophiurides. Son hôte spécifique n'a cependant pas encore été identifié. Sa présence est signalée jusqu'à 2.500 mètres de profondeur. On le trouve en Atlantique Nord (est du Canada, nord-est des Etats-Unis d'Amérique, Groenland, de l'Islande au nord de la Norvège), au sud jusque dans l'archipel des Canaries et à l'est en Méditerranée. La coquille atteignant de 7 à 12,5 mm de hauteur est élancée, de forme cylindrique avec un apex émoussé. Le dernier tour occupe environ la moitié de la hauteur totale de la coquille, la columelle est fortement enroulée sur son axe et l'ouverture de la bouche est très rétrécie (de là le nom de l'espèce « stenostoma » signifiant bouche étroite) (Fretter & Graham 1982 - Bouchet & Warén 1986).

RÉCOLTES PERSONNELLES

Un spécimen de *Scaphander lignarius* (15,9 x 9,2 mm) récolté vivant à l'ouest de l'Islande (64°12'N-25°17'W) au printemps 2014 par environ 250 mètres de fond a été disséqué. Dans la partie du tube digestif précédant l'estomac (muni des trois plaques destinées à broyer les proies enrobées de chitine ou de calcaire) se trouvait un spécimen de *Haliella stenostoma* (6,2 x 1,5 mm) pourvu de ses parties molles et de son opercule.

DISCUSSION

Comme l'indiquent Thompson (1976) et Eilersten & Malaquias (2013) le régime alimentaire des représentants du genre *Scaphander* Montfort, 1810 est très large. La présence de *Haliella stenostoma* dans l'œsophage d'un spécimen de *Scaphander lignarius* n'a donc rien de spécifique et est le fruit du hasard ayant conduit l'opisthobranche dans sa quête alimentaire sur la route de cet Eulimidae. La coquille n'ayant pas encore franchi le gésier explique que celle-ci a été trouvée intacte sans aucune altération. Un autre spécimen de *Scaphander lignarius*, d'une provenance voisine à celui faisant l'objet de cette note, a également été disséqué. Dans son cas, le bol alimentaire était présent non plus dans l'œsophage mais dans le gésier de l'animal où les plaques « mastieatrices » avaient déjà accompli leur travail de broyage. Il consistait en de nombreux fragments de tube calcaire de *Ditrupa arietina* (O.F. Müller, 1776) (annélide - polychète - Serpulidae) dont la forme ressemble par convergence à celle d'un dentale (mollusque - scaphopode).

CONCLUSION

La connaissance de la biologie (mode de vie, habitudes alimentaires, ...) des espèces animales marines (mollusques, échinodermes, poissons ou autres) peut amener à collecter des espèces de mollusques (commensaux, parasites, ou tout simplement faisant partie du régime alimentaire d'un groupe biologique tout à fait différent) qui sont difficiles à se procurer par des voies classiques (dragages, collecte in situ par plongée, ...) vu leur petite taille ou leur « rareté » dans le milieu marin.

REMERCIEMENTS

Remerciements à Jónbjörn Pálsson du MRI (Marine Research Institute) de Reykjavik (Islande) pour la mise à disposition des spécimens de *Scaphander lignarius*.

LÉGENDES

Figs. 1 - 4. *Scaphander lignarius* (Linnaeus, 1758) : 15,9 x 9,2 mm: **(1)** Face ventrale. - **(2)** Face dorsale. **(3)** Plaques du gésier - 6,2 mm. **(4)** Détail de la sculpture de la coquille - zone A agrandie. **Figs. 5 - 6.** *Haliella stenostoma* (Jeffreys, 1858) : 6,2 x 1,5 mm. **(5)** Coquille à l'échelle de celle du *Scaphander*. - **(6)** Même coquille agrandie.

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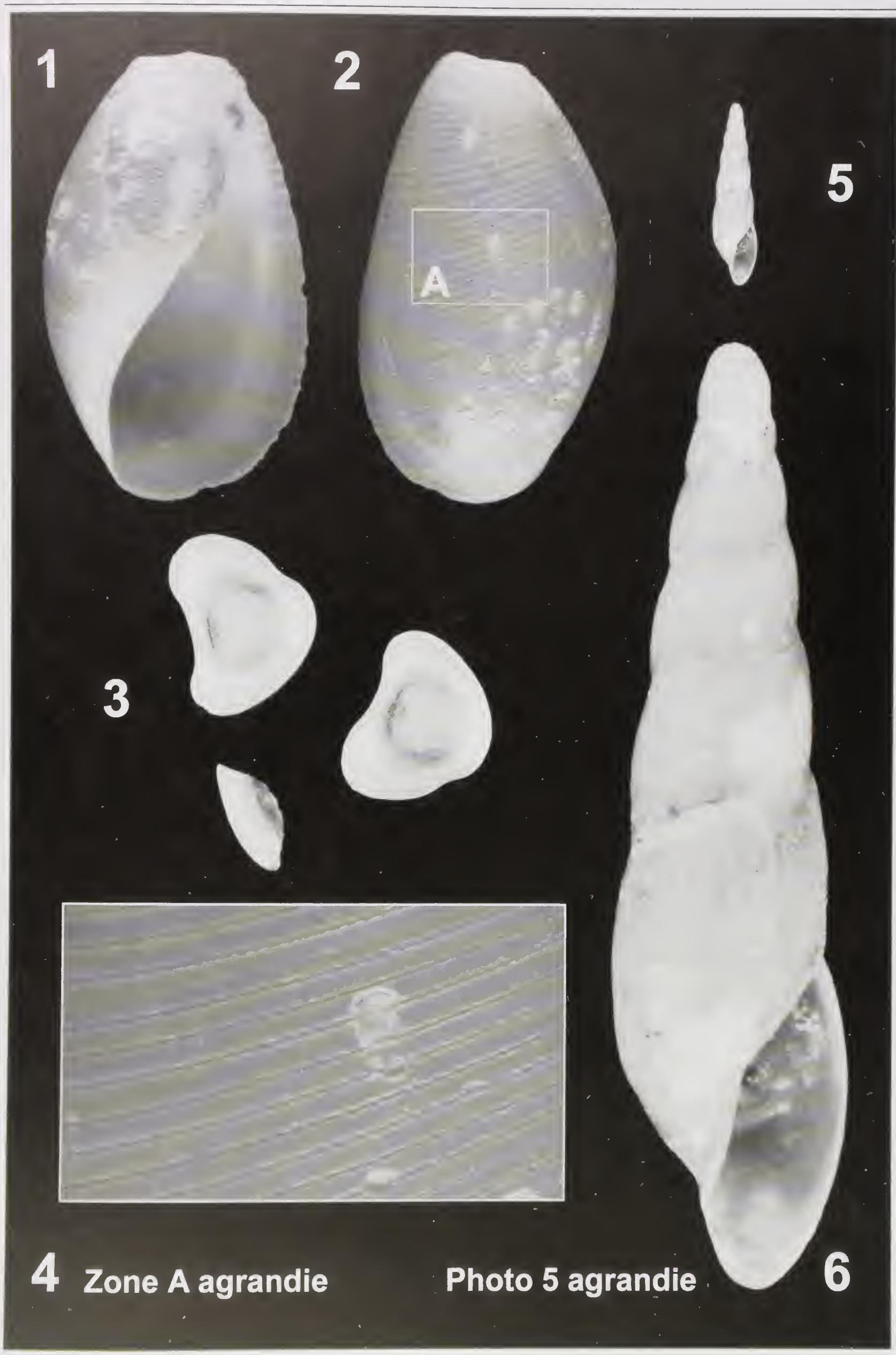
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L'excursion du samedi 24 mai 2014 : la réserve naturelle du Poelbos à Jette

Claude VILVENS

Nous avions choisi cette fois pour nos prospections malacologiques une zone naturelle de la Région bruxelloise, à savoir la réserve naturelle du Poelbos. Elle située au nord de Bruxelles, sur les communes de Jette et Ganshoren. C'est une grand zone verte de plus de 120 hectares, traversée par la vallée du Molenbeek. Cette réserve naturelle régionale, site Natura 2000, est gérée en deux modes : la partie nord du site est gérée par la CEBO (Commission de l'environnement de Bruxelles ouest) et n'est accessible qu'au cours des visites guidées; le reste est géré par Bruxelles Environnement-IBGE.

Cette balade malaco, à destination plus particulière des membres de la CEBO, avait été précédée d'un exposé sur la détermination des escargots de Wallonie-Bruxelles dans nos locaux le 10 mai (voir compte-rendu p.53).

Jean Rommes, l'un des responsables de la CEBO, par ailleurs membre éminent de Natagora, nous attendait donc ce jour-là, seulement accompagné d'une photographe d'une rare compétence. Nous étions donc 4 fois plus nombreux que notre public cible : décidément, les mollusques ont du mal à faire recette ☹ !

Ceci ne nous a pas empêché de mettre en commun nos connaissances : nous avons découvert un Poelbos avec un nombre inattendu d'espèces animales (en particulier des oiseaux) et végétales et, en retour, nous avons attiré l'attention de nos guides sur les escargots et limaces rencontrés au hasard des sentiers, depuis le bois d'entrée jusqu'à la vallée en contrebas. Là nous attendait une bien belle surprise : la naissance en direct de jeunes *Balea biplicata* ! On se souviendra que cette espèce ovovivipare : les œufs fécondés sont incubés dans le corps de la "mère" et expulsé lorsque les larves sont prêtes à naître. Un événement qu'aucun d'entre nous n'avait encore observé !

Côté récolte, le résultat n'est pas trop mal pour un coup d'essai et seulement deux bonnes heures de prospection - jugez-en plutôt.

Listes des espèces de mollusques terrestres et dulcicoles observées le 24/5/2014 à la réserve du Poelbos
(déterminations : Johann Delcourt, Etienne Meuleman, Claude Vilvens)

Nom latin	Nom vernaculaire
Aegopinella nitidula (Draparnaud, 1805)	Grande luisantine
Anisus vortex (Linnacus, 1758)	Planorbe tourbillon [eau douce]
Arion subfuscus (Draparnaud, 1805)	Arion brun [limace]
Arion vulgaris Moquin-Tandon 1855	Arion vulgaire [limace]
Balea biplicata (Montagu, 1803)	Clausilie à deux plis
Cepaea hortensis (Müller, 1774)	Escargot des jardins
Cepaea nemoralis (Linnaeus, 1758)	Escargot des haies ou des bois
Clausilia bidentata (Ström, 1765)	Clausilie noirâtre
Cochlicopa lubrica (Müller, 1774)	Bulime brillant
Cornu aspersum (Müller, 1774)	Petit-gris
Discus rotundatus (Müller, 1774)	Hélice bouton
Hippeutis complanatus (Linnacus, 1758)	Planorbe aplatie [eau douce]
Monachoides incarnatus (Müller, 1774)	Moine des bois
Oxyloma elegans (Risso, 1826)	Ambrette élégante
Succinea putris (Linnaeus, 1758)	Ambrette commune
Trochulus hispidus (Linnaeus, 1758)	Hélice veloutée

Bien sûr, d'autres visites seront nécessaires pour dresser un début d'inventaire de cette zone si intéressante.

Belae biplicata : sur un tronc, avec une ponte en train d 'éclore, des juvéniles sur un rocher

Aegopinella nitidula et ***Cochlicopa lubrica*** au creux e la main

Succinea putris dans son environnement au bord de l'eau

Arion subfuscus sur un tronc d'arbre

Arion vulgaris au repos sur un tronc d'arbre

On peut également signaler une belle variété de coloration chez les *Cepaea nemoralis* observés (pour rappel : les bandes foncées sont numérotées de 1 (la plus proche du sommet) à 5 (la plus éloignée), 0 indiquant une bande absente, des parenthèse autour de plusieurs numéros indiquant que les bandes sont fusionnées) :

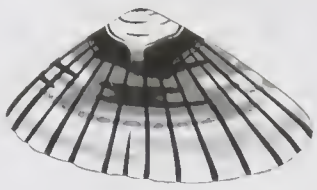
fond jaune	00300, (123)(45), (12)3(45), 123(45), 003(45), 12305
fond jaune-orange	(12)345
fond brun	00000

Pour *Cepaea hortensis*, seule la forme brune 00000 a été observée.

Voir aussi le lien

http://www.scheutbos.be/bulletins/bulletincebo295.pdf avec " Naissances au Poelbos" par Christiane Delongueville & Claude Vilvens - pp.6-7.

Claude Vilvens

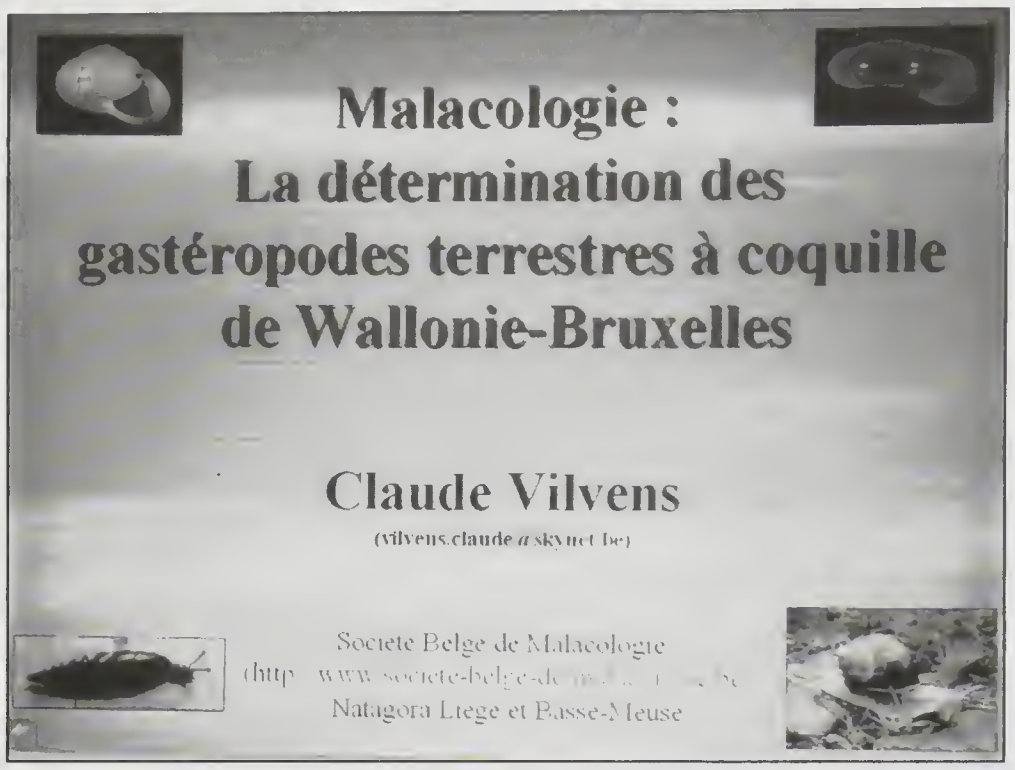


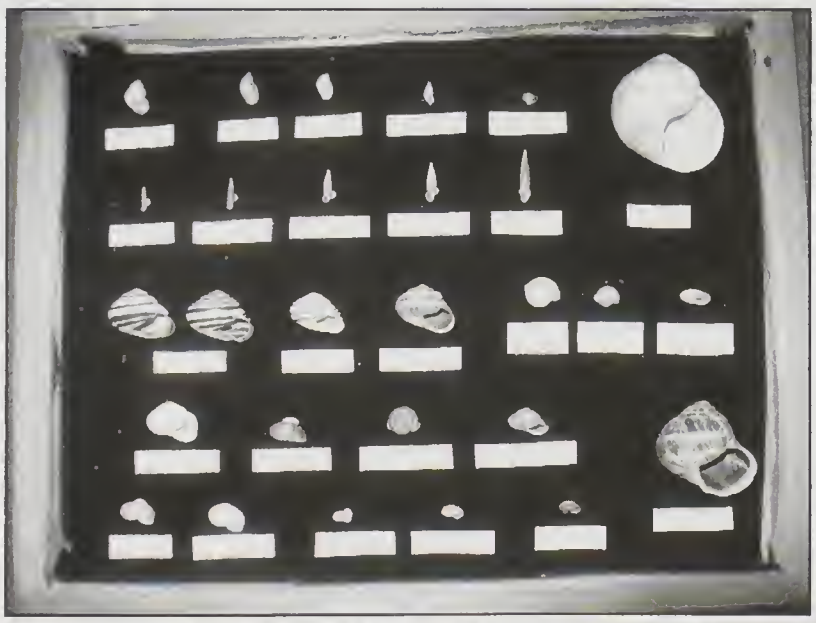
L'écho des réunions

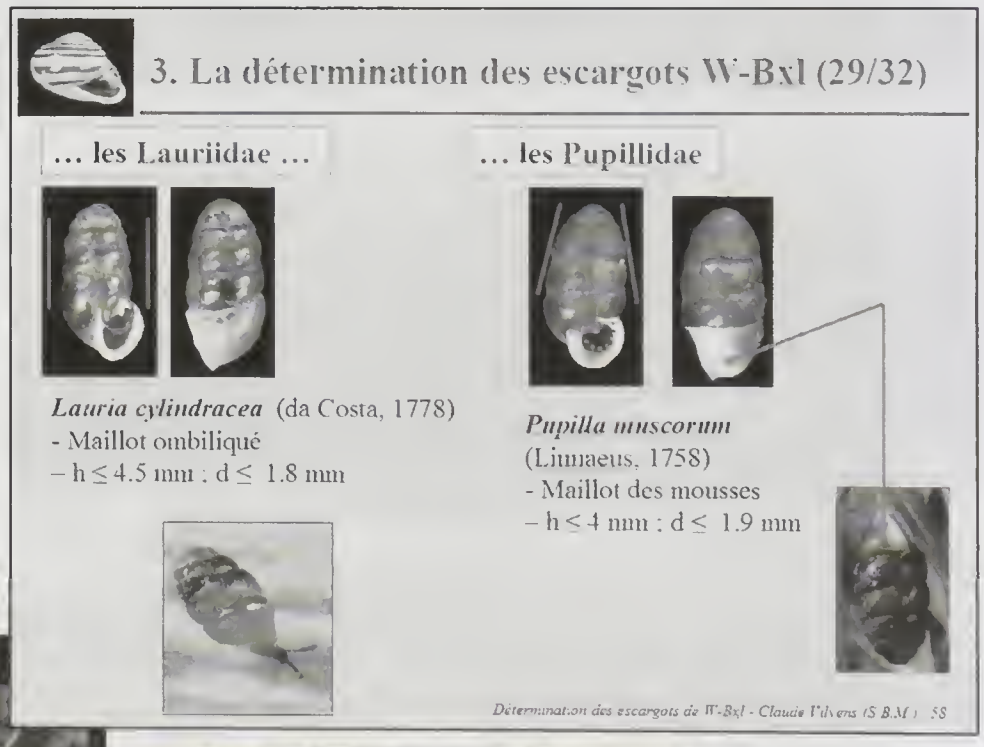
Étienne MEULEMAN et Claude VILVENS

Réunion du 10 mai 2014 (EM) → C. Vilvens : La détermination des terrestres courants de Wallonie et Bruxelles

Comme évoqué dans le compte-rendu de l'excursion au Poelbos ci-dessus (p.49), la réunion proposée ici était destinée à la fois à nos membres (dont certains sont surtout des spécialistes des mollusques marins) et aux naturalsites (notamment ceux de la CEBO évoquée ci-dessus) : il s'agissait en effet d'une initiation à la détermination des mollusques terrestres à coquille commune - bref, des escargots que l'on peut rencontrer assez facilement dans la nature en Wallonie et en Région bruxelloise. Aidés par les collègues spécialement compétents dans le domaine, le Président a dressé un tableau général de ces espèces avec les principaux critères simples de détermination.







Etienne Meuleman

Réunion du 14 juin 2014 (CV) → **Le quiz de la SBM**

C'est devenu une (bonne) habitude : la réunion du mois de juin est celle du quiz de la S.B.M. Cette année, le Conseil d'Administration avait préparé 60 questions illustrées par Powerpoint. Comme "Mr Loyal", Roland Scaillet a excellé dans la présentation des questions tirées dans un ordre aléatoire, tandis que Claude Vilvens s'occupait des "corrections" (pour un prof, c'est logique ;-)). Comme d'habitude aussi, chacun est reparti avec un lot (une belle coquille) ☺ Voir deux des lauréats ci-dessous avec leur trophée !

Claude Vilvens

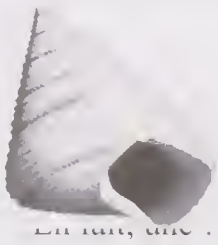
Vie du Conseil d'administration de la S.B.M.

Claude VILVENS

Le Conseil d'administration de la SBM travaille dans l'ombre (enfin, plus ou moins ;-)) pour que la S.B.M. apporte à ses membres tout ce qu'ils peuvent en attendre. Comme signalé dans la compte-rendu de l'A.G. 2014 (voir Novapex/Société 15(2)), **Annie Langleit** a donc décidé de prendre sa retraite du CA et a démissionné de son poste de secrétaire qu'elle occupait avec brio depuis de nombreuses années. Son cadeau ayant décidé de traîner en chemin, nous avions du nous résoudre à lui offrir le jour de l'A.G. un simple "bon pour" en attendant réception. La réunion du 10 mai a été l'occasion d'enfin lui offrir son cadeau : une broche en forme de pecten ☺ !

Le nouveau C.A. de la S.B.M.

Roland Scaillet (Administrateur), C.laude Vilvens '(Président), Marc Alexandre (Trésorier)
Roland Houart (Responsable Novapex), Christiane Delongueville (Secrétaire), Etienne Meuleman (Vice-président)



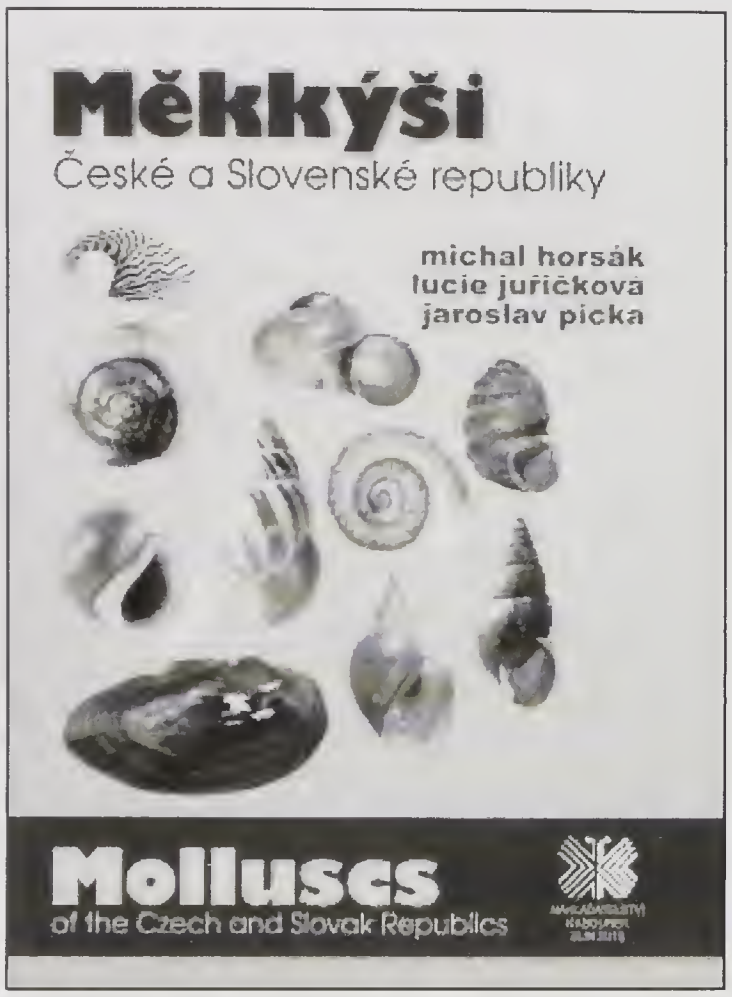
Quelques nouvelles publications

Claude VILVENS

Molluscs of the Czech and Slovak Republics

par **M. Horsák, L. Juricková & J. Picka**

Editions Kodiak / 1ère édition Décembre 2013 264 pages – illustrations couleurs Couverture dure, 17 x 23.4 cm	**ISBN** : 978-80-86447-15-5 **Prix :** 60.00 EUR

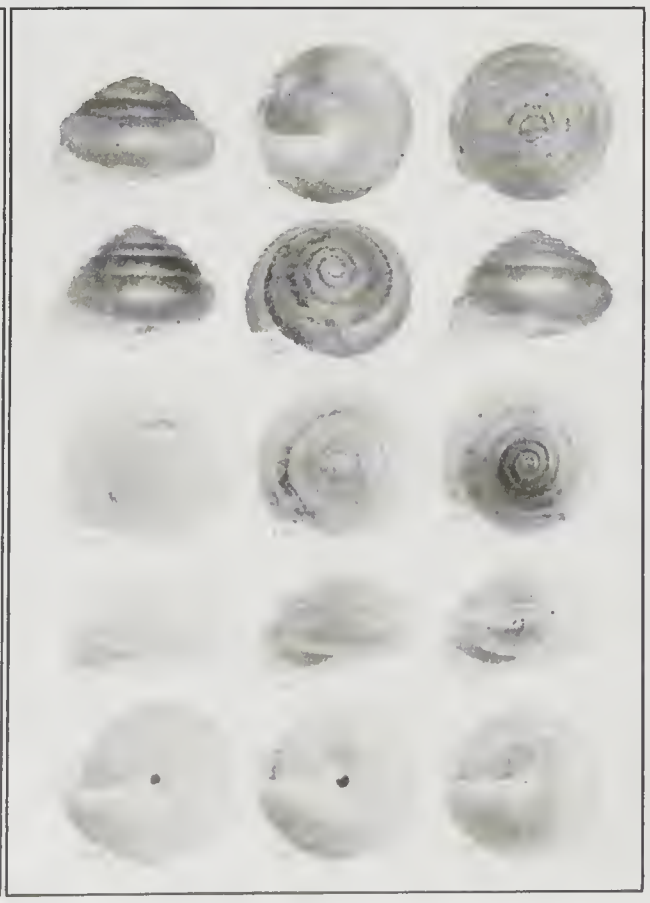


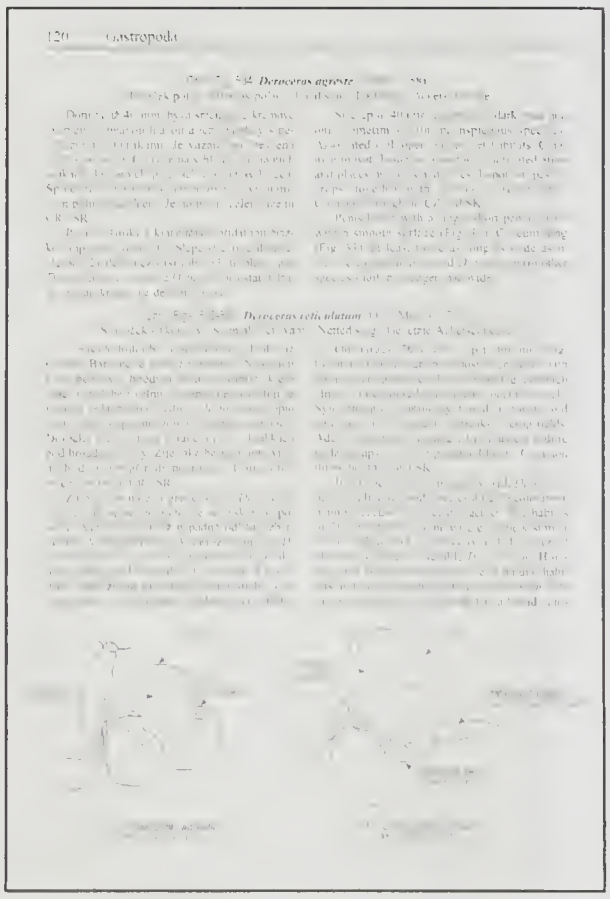
Mais non, je n'ai pas appris le tchèque ;-) : ce livre splendide est en en fait entièrement bilingue tchèque/anglais ☺ !
Il présente bien sûr la malacofaune de Tchéquie (Bohème et Moravie) et Slovaquie.

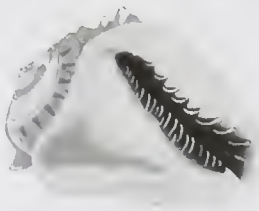
"Fort bien", me direz-vous, " mais je n'ai pas l'intention d'aller là-bas, ou alors à Prague seulement". Certes. Mais ce livre, en évoquant tous les mollusques terrestres (escargots et limaces) et dulcicoles, passe en réalité en revue bon nombre de mollusques de Belgique ! Et c'est évidemment là le gros intérêt de ce livre, qui est remarquablement bien fait : texte descriptif assez court, mais donnant l'essentiel pour déterminer l'espèce considérée, avec le petit détail qui permet de faire la différence avec une espèce apparentée ! Quant aux illustrations, elles sont excellentes : très bonne qualité, 3 vues pour tous les terrestres à coquille où c'est nécessaire, limaces présentées in situ.

Un superbe livre que je n'ai pas hésité à m'offrir à la dernière Bourse d'Antwerpen : ce livre vaut son prix, une forme d'exploit ;-) !

Claude Vilvens







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Etienne MEULEMAN

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(Belgique)
N°277, mai – juin 2014

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-Barbecue 13 juli – NALAH
-Oude jaargangen Gloria Maris
-Peter Friedrich Röding (1767-1846): the luckiest man in the conchological world (by M. Kovalis)
-Publicity

Scientific contributions

1. *D. Monsecour & H. Dekker*
   A new species of *Colubraria* (Gastropoda: Colubrariidae) from the Red Sea

2. *N. N. Thach*
   A new *Amphidromus* (Gastropoda: Camaenidae) from Vietnam

3. *N. Severijns, M. Hansen, R. Sablon, Th. Vercauteren, H. De Blauwe, S. Debruyne, F. De Winter, T. Hansen, J. Hoozee, F. Jacobs, C. Peeters, G. Vancauwenberghe & C. Vandevelde*
   Nieuwe waarnemingen van het voorkomen van *Unio crassus riparius* C. Pfeiffer, 1821 en *Pseudanodonta complanata elongata* (Holandre, 1836) (Bivalvia, Unionoidea, Unionidae) in België

4. *H. Dekker*
   Range and colour extension for *Engina muznoides* (Gastropoda: Buccinidae)

5. *J. Ronsmans*
   Subulina striatella (Rang, 1831) (Gastropoda, Achatinoidea, Subulinidae) een nieuwe, exotische slak in de Plantentuin in Meise

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29	La Nature ne cessera jamais de nous étonner par Th. Vulliet
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N. N. Thach

A new *Scaphella* from the Danian Limestones of the Paris Basin
J-M. Pacaud

***Phasmoconus (Fulgiconus) santinii* (Gastropoda, Conidae), a new surprising species from the Fiji.**
E. Monnier & L. Limpalaër

New Species of Conidae and Conilithidae (Gastropoda: Conoidea) from the Bahamas, Eastern Caribbean, and Brazil
E. J. Petuch & R. Myers

Recent findings from the Islands of Maio and Boa Vista in the Cape Verde Archipelago: Description of three new *Africonus* species (Gastropoda: Conidae)
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(Pays-Bas)
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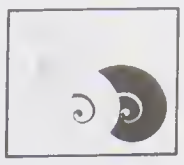

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MALACOLOGIA – Mostra mondiale Cupra Maritima

(Italie)
N°81, novembre 2013

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(Italie)
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MALACOLOGIA – Mostra mondiale Cupra Maritima

(Italie)
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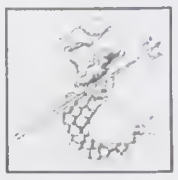

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- Mollus research grant.
- Notes on the Truncatelloidea (Gastropoda : Caenogastropoda) in Australia. Anders Hallan.
- Evolution, gene expression and enzymatic production of Tyrian purple : A molecular study of the Australian muricid *Dicathais orbita* (Neogastropoda : Muricidae). Patrick Laffy.
- Can oysters resilience of coastal biodiversity to environnement change ? Dominic McAfee.
- Assessing genetic diversity in the native Sydney rock oyster (*Saccotrea glomerata*) from the Sydney estuary, Autralia. Aroon R. Melwani.

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(Japon)
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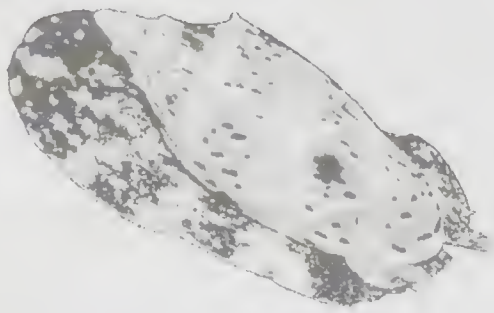

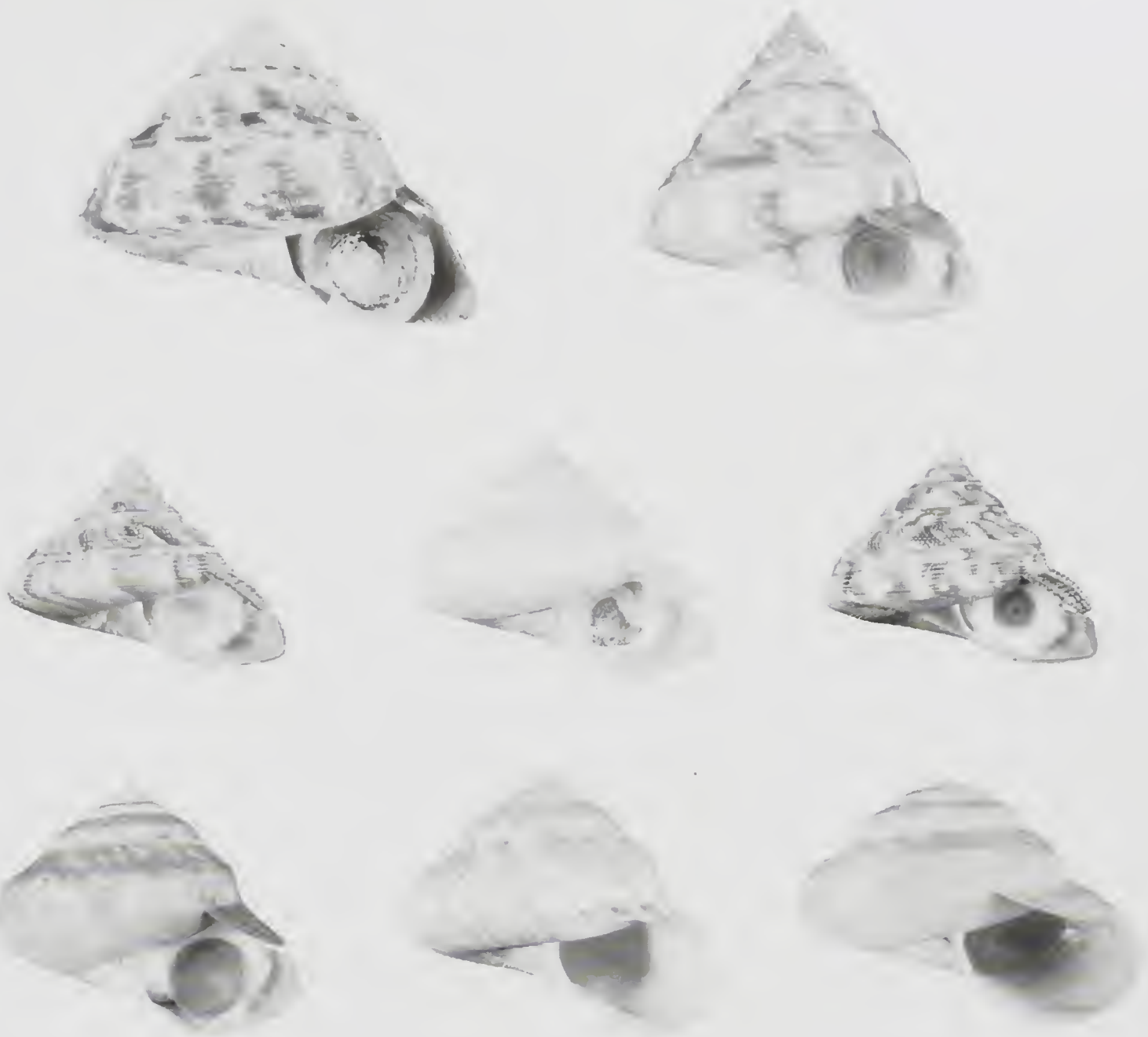

E. adansonianus adansonianus (Crosse & Fischer, 1861),Bahamas, 106.1 mm. *M. anseeuwi* (Kanazawa & Goto, 1991), Philippines, 111.4 mm. *P. amabilis* f. *mauren* Harasewych & Askew, 1993, USA, 42 mm. *B. tangaroana* (Bouchet & Métivier, 1982), New Zealand, 55.9 mm. *P. quoyanus* (Fischer & Bernardi, 1856), Curaçao, 50.7 mm. *B. philpoppei* Poppe, Anseeuw & Goto, 2006, Philippines, 65.1 mm. *B. charlestonensis* Askew, 1987, Martinique, 77.3 mm. *B. midas* (Bayer, 1965), Bahamas, 82.7 mm.

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Grandes marées de l'année 2014

Christiane DELONGUEVILLE et Roland SCAILLET

- Enfin une bonne année avec des marées de 115 en mars et en septembre. En février, août et octobre, les marées présenteront également de beaux coefficients supérieurs à 110. Voilà de quoi nous réjouir !

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Mercredi 1	(96) - 100
	Jeudi 2	104 - 107
	Vendredi 3	108 - 108
	Samedi 4	106 - 103
	Jeudi 30	(95) - 101
	Vendredi 31	107 - 111

Février	Samedi 1	113 - 114
	Dimanche 2	113 - 110
	Lundi 3	106 - 101
	Vendredi 28	(95) - 102

Mars	Samedi 1	108 - 112
	Dimanche 2	114 - 115
	Lundi 3	114 - 112
	Mardi 4	108 - 102
	Dimanche 30	104 - 107
	Lundi 31	109 - 109

Avril	Mardi 1	108 - 106
	Mercredi 2	102 - (98)

Mai	-	-

Juin	Samedi 14	(98) - 100
	Dimanche 15	100 - 99

Juillet	Dimanche 13	101 - 105
	Lundi 14	106 - 107
	Mardi 15	106 - 104
	Mercredi 16	101- (96)

Août	Dimanche 10	(95) - 101
	Lundi 11	106 - 110
	Mardi 12	112 - 113
	Mercredi 13	112 - 110
	Jeudi 14	106 - 101

Septembre	Lundi 8	(97) - 104
	Mardi 9	109 - 113
	Mercredi 10	115 - 115
	Jeudi 11	114 - 111
	Vendredi 12	106 - 100

Octobre	Mardi 7	(96) - 102
	Mercredi 8	106 - 109
	Jeudi 9	111 - 111
	Vendredi 10	109 - 106
	Samedi 11	102 - (96)

Novembre	Jeudi 6	(98) - 100
	Vendredi 7	101 - 101
	Samedi 8	100 - (98)

Décembre	-	-

Conseils pour une marée réussie et soucieuse de l'environnement : Remettez toujours les pierres déplacées en bon ordre. Observez, photographiez et n'échantillonnez que le strict nécessaire. Soyez prudents et renseignez-vous sur les heures des marées à l'endroit où vous vous trouvez.

REFERENCE :

Annuaire des Marées pour 2014 - Ports de France - Métropole - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Paris - 256 p.*

Wimereux (Pas-de-Calais)

Les données reprises dans cet article peuvent également se retrouver sur notre site Internet :

http://www.societe-belge-de-malacologie.be

NOV
5527

NOVAPEX
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Prochaines activités de la SBM

Claude VILVENS

Lieu de réunion : **A partir de 14h, à notre local habituel :**

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

Pour rappel, ***pause en janvier*** *pour éviter les déplacements périlleux sur des routes enneigées ou verglacées !*

SAMEDI 14 FEVRIER 2015

Christiane Delongueville et Roland Scaillet: Pholadoidea - Bivalves mineurs de fond

Roland et Christiane vous emmènent cette fois dans les sombres galeries de glaise ou de bois à la découverte de bivalves adaptés aux forages en tous genres. Coup d'œil sur les Pholadidae, Teredinidiae et Xylophagidae de nos eaux européennes.

***

***

SAMEDI 13 MARS 2015

Tout le monde : ASSEMBLÉE GÉNÉRALE DE LA SBM.

-- Voir annonce officielle page suivante --

Le bilan, les projets, les souhaits, les critiques (pas trop quand même) ... Tout le monde a la parole !

Nous vous attendons donc nombreux … d'autant que cette Assemblée générale se termine toujours par un petit verre ☺ … En effet, si il convient de rappeler l'importance de cette Assemblée, il faut aussi en souligner le côté convivial.

***

Réservez *déjà dans vos agendas le* ***25/4/2015***, le ***23/5/2015*** (excursion) *et le* ***13/6/2015***.

***

Nous vous souhaitons une très bonne année 2015 !!!

Pour les informations de dernière minute (notamment des modifications de l'agenda prévu) :

Sur Internet :

http://www.societe-belge-de-malacologie.be/

L'Assemblée Générale de la Société Belge de Malacologie

Conformément aux statuts de la Société Belge de Malacologie A.S.B.L.,une **Assemblée Générale** de l'Association se tiendra le samedi **14 mars 2015** à **14h** en son local de la Rue de Genève, 470b à Scharbeek - Bruxelles.

Ordre du jour

- Rapport moral
- Comptes de l'exercice 2014
- Prévisions budgétaires pour l'exercice 2015
- Election ou réélection d'administrateurs (les **candidatures**, démissions ou **demandes de réélection** doivent parvenir au Président actuel pour le 16 mars 2015 au plus tard).
- Publications de la Société
- Cotisations 2016
- Divers

Nos membres sont instamment priés d'assister à cette Assemblée Générale

Nous rappelons que, conformément à l'article 6 des statuts, tout membre peut se faire représenter par un autre membre, moyennant procuration écrite. Un seul mandataire ne peut cependant recevoir que trois mandats de l'espèce.

Pour le conseil d'administration,

C. DELONGUEVILLE
Secrétaire

C. VILVENS
Président

Novapex/Société : la publication généraliste de la SBM

Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

Afin de faciliter le travail de la Rédaction, il est vivement (et le mot est faible ;-)) souhaité de respecter les règles suivantes pour les articles proposés :

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- texte de taille 10, titres de taille 12;
- interligne simple;
- toutes les marges à 2,5 cm;
- document en une seule section;
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- photos en version électronique JPG ou PNG.

Merci pour les Scribes ;-) ! N'hésitez pas à demander une page avec en-tête pour cadrer au mieux vos travaux (vilvens.claude@skynet.be ou e.meuleman@skynet.be).

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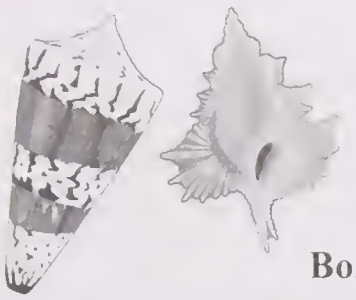
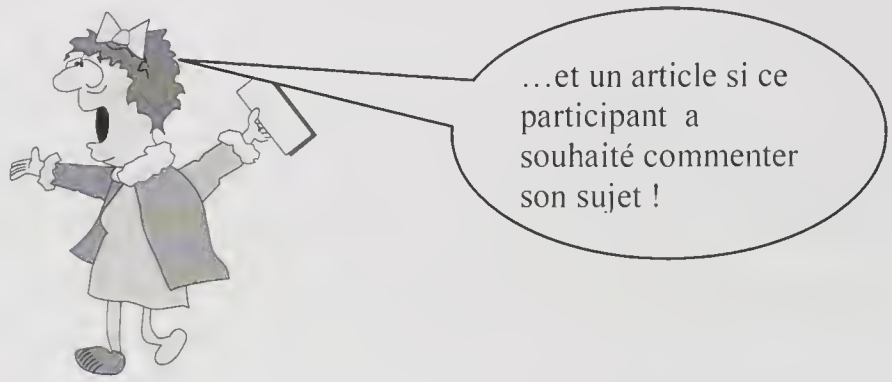


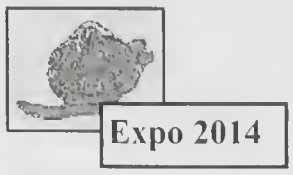
L'exposition 2014 de la S.B.M.

Mise en page Roland SCAILLET

Bons vœux de rétablissement à Etienne qu'un problème temporaire de santé à éloigné de la rédaction de cette rubrique

La réunion de la Société Belge de Malacologie a été consacrée ce **11 octobre 2014** à son Exposition annuelle: ses membres ont présenté quelques coquilles intéressantes de leur collection et les ont commentées avec passion et originalité. Nous n'étions pas légion, mais comme on dit, mieux vaut la qualité que la quantité ! Pour rappel, l'exposition est destinée à tout le monde et tout le monde est donc le bienvenu.
Comme chaque année, nous allons relater les divers thèmes abordés. Je vous invite à suivre le guide et à vous laisser emporter par la douce musique des coquillages. Un grand merci aux visiteurs venus découvrir les merveilles de la malacologie. En voiture !





Christiane Delongueville & Roland Scaillet

Le genre *Pecten* O.F. Müller, 1776 en Europe

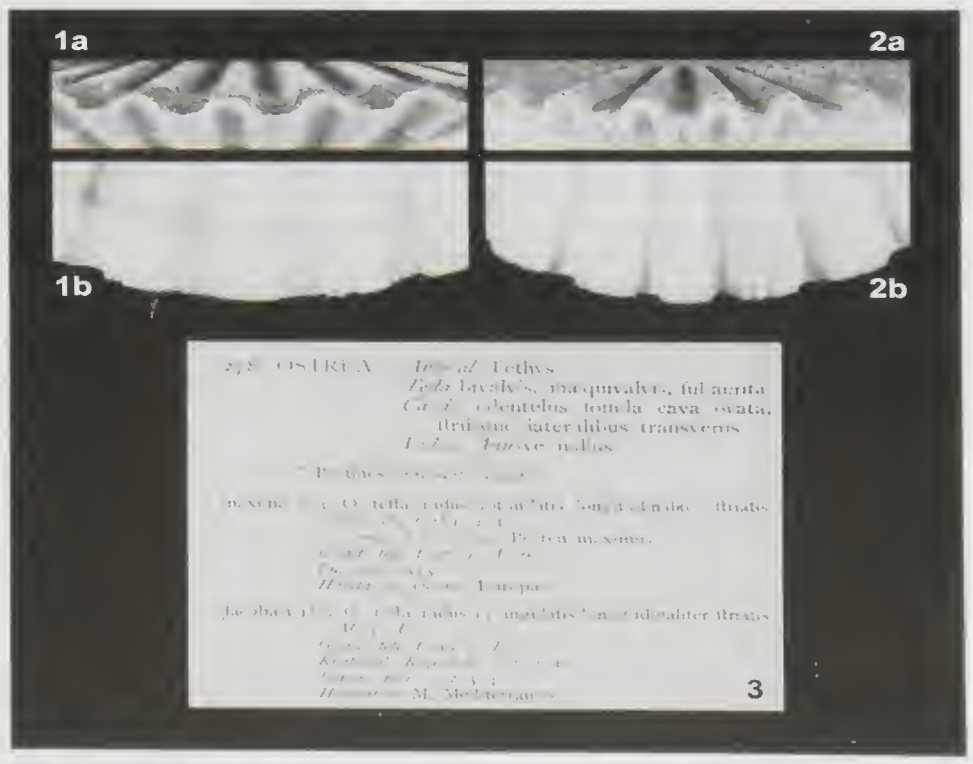
Le genre *Pecten* O.F. Müller, 1776 est représenté en Europe par deux espèces : *Pecten maximus* (Linnaeus, 1758) et *Pecten jacobaeus* (Linnaeus, 1758) (Fig. 3 : Caroli Linnaei - Systema Naturae 1758).

Pecten maximus est caractérisé par des côtes radiaires de section arrondie et striées longitudinalement. Sur la valve droite (inférieure - bombée), l'intervalle entre les côtes est garni de stries radiaires plus ou moins prononcées. Sur la valve gauche (supérieure - plate) de fines lamelles comarginales sont présentes avec parfois des stries radiaires peu marquées (Figs. 1a - 1b). Distribution : nord de la Norvège, Iles Féroé, Mer du Nord jusqu'aux aux côtes atlantiques du nord du Maroc, ainsi qu'en Mer d'Alboran (Méditerranée).

Pecten jacobaeus est caractérisé par des côtes radiaires de section quadrangulaire et fortement striées longitudinalement sur la partie haute de ces côtes. Sur les valves gauche et droite, l'intervalle entre les côtes est garni de lamelles horizontales denses sans que l'on puisse généralement y distinguer des stries radiaires (Figs. 2a - 2b). Distribution : Mer Méditerranée, à l'exception de la Mer d'Alboran. En Atlantique, sud de la Péninsule Ibérique, Maroc, Archipels des Açores, de Madère et des Canaries.

En Mer d'Alboran, il y a un hiatus dans la distribution de *Pecten jacobaeus*. Dans cette zone, l'espèce *Pecten maximus* est présente. Certains spécimens y montrent néanmoins un aspect un peu différent de leurs congénères atlantiques avec des caractères spécifiques quelque peu moins typés et rappelant parfois certains de *Pecten jacobaeus*.

Des spécimens couvrant l'aire de distribution des deux espèces ont été présentés. Plusieurs exemplaires provenant de la Mer d'Alboran (Espagne et Maroc) ont permis d'illustrer les singularités des coquilles de cette zone très particulière de la Méditerranée.



Annie Langleit

Achatinidae Swainson, 1840

Cette année, j'ai choisi les Achatinidae en souvenir de mes années passées en Afrique et pour leur beauté souvent ignorée.

Quant aux déterminations, c'est beaucoup plus problématique ; *Achatina*, *Archachatina, Limicolaria,…* je n'ai pas encore réuni assez de documentation fiable, donc des erreurs sont plus que probables. Mais comme pas mal de spécialistes commencent à s'y intéresser, j'ai bon espoir de pouvoir un jour les classer correctement.
Donc, en attendant, contemplez, juste pour le plaisir des yeux !

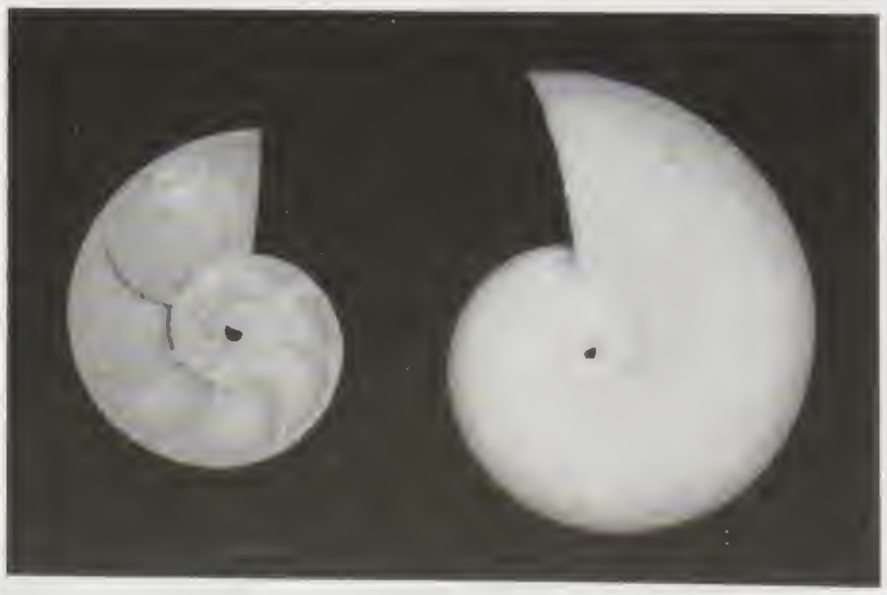
Etienne Meuleman

Une sélection de ses « demi-portions »

Etienne est-il un coupeur de cheveux en quatre ?
Que nenni, mais bien un de coupeur de coquilles en deux !
Admirez l'élégance interne d'un Nautile, d'une turritelle ou encore d'une ammonite…

Non content de couper les coquilles en deux, voila qu'il se « paie des tranches » de murex.

Et quand il ne découpe pas, voilà qu'il photocopie… Pas comme tout le monde bien entendu.... en 3D, excusez nous du peu, et en jaune en plus !!!



Ce garçon a décidément des mœurs étranges… mais cela ne nous a pas déplu…

Roland Houart

Fouilles au grenier (suite)

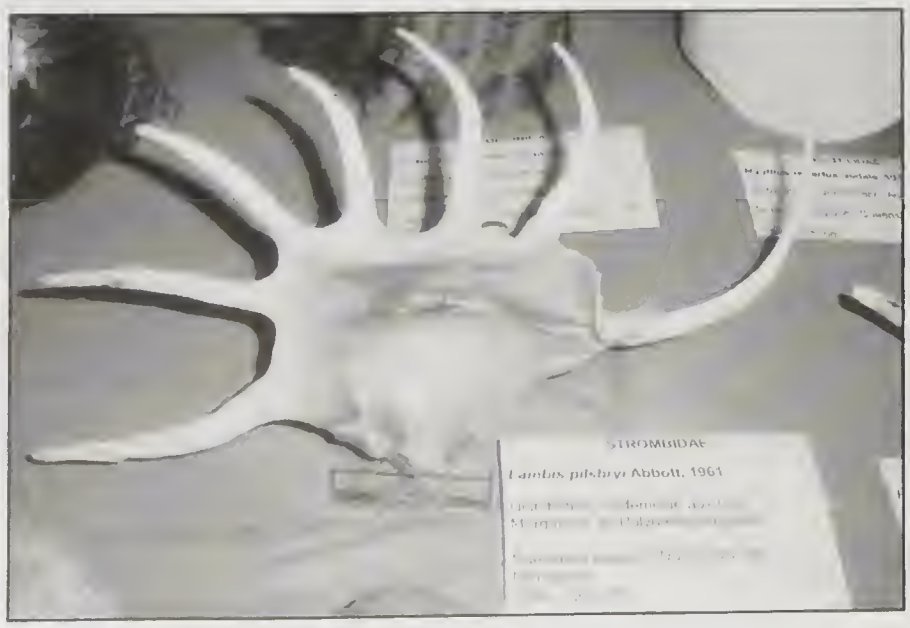
Comme je me vois mal revenir tous les ans avec des Muricidae (ou des Veneridae, voire des Nassariidae, les 2 familles qui continuent à me passionner, sans pour autant me lancer dans leur étude...), je me suis dit que je pouvais continuer à fouiller mon grenier à la recherche d'autres espèces...
En 2011 j'en avais exposé une petite quantité. Cette année j'ai décidé de remettre cela avec une deuxième partie.
Comme je ne possède pas de grandes vitrines où je pourrais les exposer chez moi, je profite de ces expositions annuelles pour les sortir temporairement de l'ombre et vous les présenter... avant qu'elles n'y retournent pour un certain temps.

Quelques commentaires

Une petite curiosité d'abord, sous la forme d'un ...Trochidae!
Ce spécimen avec son étiquette originale a été retrouvé dans une ancienne collection. C'est amusant quand on imagine l'histoire de cette petite coquille qui a été récoltée il y a plus de 120 ans au Japon!

NAUTILIDAE
Il y pour l'instant 3 ou 5 espèces vivantes de Nautilidae selon différents auteurs.
Nautilus pompilius (la plus commune)
Nautilus macromphallus, de Nouvelle-Calédonie
Nautilus scrobiculatus, probablement la plus rare. Elle vit au large des Iles Salomons.
Et puis, *Nautilus belauensis* et *Nautilus repertus* qui selon certains auteurs ne seraient que des formes de *Nautilus pompilius*.

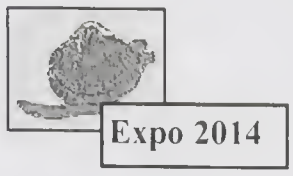
VERMETIDAE et SILIQUARIIDAE
La coquille appartenant à ces familles a l'aspect d'un tube à enroulement irrégulier dont les tours sont séparés et dont la forme est irrégulière. Les espèces vivent souvent en colonies, dans toutes les mers.



CAMPANILIDAE

Les Campanilidae sont assez proches parents des Cerithiidae. *Campanile symbolicum* exposé ici peut atteindre la taille de 20 cm. Elle vit au large de la côte du sud-ouest de l'Australie.

Pour le reste, j'ai exposé quelques beaux Strombidae (*Lambris pilsbryi* des Marquises - photo ci-contre), Turbinidae et Ficidae.
J'ai utilisé WoRMS pour avoir les dernières informations au sujet des familles et genres à utiliser.



Chris Vos

Histoire, biologie et économie autour des Pinnidae

Un peu d'Histoire Naturelle :

En 1555 (Rondelet, 1555), la connaissance de ces magnifiques bivalves était d'un tel niveau, qu'on connaissait l'utilité de son byssus (très grand pour la taille de l'animal) et la symbiose avec certains crustacés (Gessner, 1558). A cette époque, la distinction entre « Pinna magna » (probablement *Pinna nobilis* Linnaeus, 1758) et « Pinna parva » (plus tard genre *Atrina*) était déjà établie. Au plus profond d'une époque encore marquée par la religion, les connaissances de biologie élémentaire était déjà bien avancées.

L'aspect Biologique :

Non seulement les « *Pinna* » se laissent « soigner » par d'autres animaux (des crustacés, comme déjà mentionné ci-dessus) mais abritent également d'autres organismes épibiontes (comme c'est le cas des huîtres fixées sur les grands spécimens de *Pinna nobilis*). Cet aspect des choses a été illustré par un grand spécimen de *Pinna nobilis,* ainsi que par un couple de crustacées (male + femelle - *Pinnotheres*) récolté dans un de ces bivalves provenant de Grèce.

L'aspect économique :

On ne sait depuis quand cela existe, mais il est établi que pendant les 17ème et 18ème siècles des filaments du byssus de *Pinna nobilis* ont été utilisés pour fabriquer des gants à l'intention des élégantes de l'époque. Ces gants sont les seuls objets manquant à ma collection consacrée aux Pinnidae. Vu leur rareté, il est peu probable que je puisse un jour m'en procurer. J'en possède une photo prise dans le Muséum d'Histoire Naturelle de Vienne (Autriche) et c'est déjà bien!
Les Pinnidae fabriquent aussi des perles (sur la coquille ou dans le manteau de l'animal) mais leur qualité est loin d'atteindre celle des huitres. En conséquence, elles n'ont jamais fait l'objet d'un véritable commerce.

Koen Fraussen

Neptunea ochotensis Golikov, 1962

Neptunea ochotensis Golikov, 1962 est sans nul doute l'une des plus belles espèces appartenant au genre *Neptunea*! Ce coquillage est assez remarquable par sa grande taille et par sa couleur blanche ou jaunâtre parfois teintée de rose. Quand on connait sa provenance, on est encore plus étonné. *N. ochotensis* vit dans les eaux glacées de la mer d'Okhotsk et de la mer de Béring occidentale. Les mollusques y sont dragués régulièrement par des pêcheurs, mais les coquilles sont si fragiles qu'il est particulièrement difficile d'en obtenir des exemplaires intacts. Un spécimen de *N. ochotensis* de belle qualité est un véritable trésor!

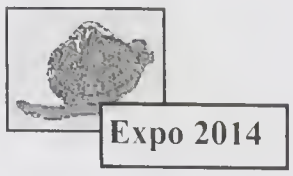
L'espèce a été décrite comme sous-espèce de *Neptunea laticostata* (*Neptunea laticostata ochotensis* Golikov, 1962: 7-8, fig. 10), par Golikov en 1962, année précédant la parution de son célèbre livre sur les *Neptunea*.

N. laticostata se distingue par sa sculpture et sa couleur caractéristiques ainsi que par son lieu de collecte: à l'époque, la partie occidentale de la mer d'Okhotsk. Depuis, *N. ochotensis* a également été trouvé dans la mer de Béring. En outre, on connaît aujourd'hui des exemplaires de couleur plus foncée, rouge-brun. Il semble donc que l'espèce soit assez variable.

Avec les spécimens qu'il nous a apporté, et à l'aide de quelques photos illustrant les fonds marins de la mer d'Okhotsk et la manière dont on y collecte les Neptunea, Koen nous a donné l'envie d'en savoir plus sur cette magnifique coquille. Pour ce, consultez :

Golikov, A. N, 1962, New species of gastropods of the genus *Neptunea* Bolten from the far-eastern seas of the USSR. *Zool.Inst.Akad.USSR.*

Golikov, A. N, 1963, Gastropod mollusks of the Genus *Neptunea* Bolten. Fauna of the USSR, Mollusks. *USSR Acad.Sci.*, 5(1): 1-183.

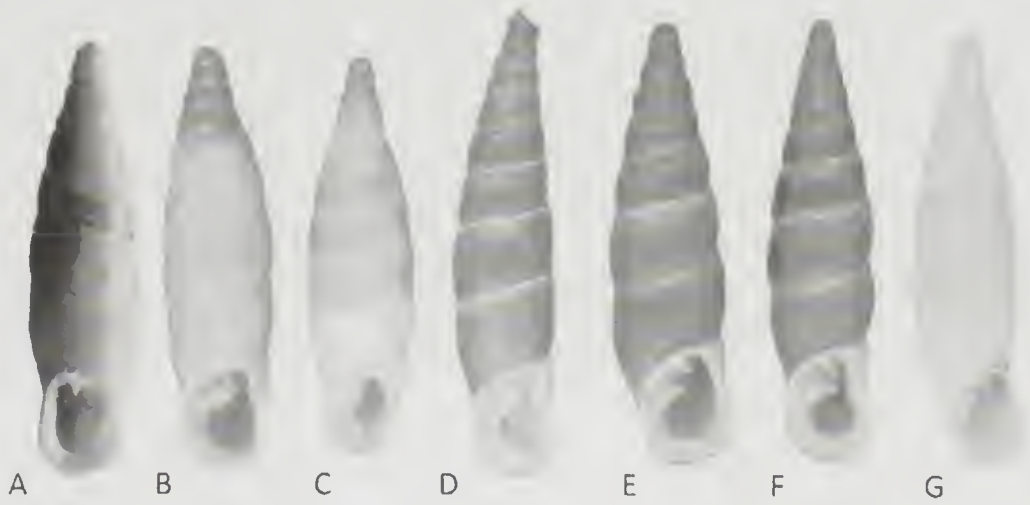


Johann Delcourt

Coquilles dextres chez les Clausiidae

L'essentiel des gastropodes présente une chiralité, ils sont soit senestres soit dextres. La très large majorité des escargots terrestres sont dextres, mais, dans certaines familles comme les Clausiliidés, les senestres sont les plus représentés. Cependant, au sein d'une même espèce, le caractère senestre ou dextre peut être observé. Ce polymorphisme est généralement très rare, souvent le résultat d'une mutation qui ne se maintient que difficilement dans une population. En effet, Ces individus mutants peuvent rencontrer de grandes difficultés à pouvoir s'accoupler avec leurs partenaires potentiels d'enroulement opposé. Ceci est d'autant plus vrai que ces espèces ont une forme globuleuse. Par contre, des cas de populations présentant autant d'individus dextres ou senestres sont aussi connus comme dans le genre *Amphidromus*. Vu la large majorité des espèces dextres, une hypothèse avance que les gastéropodes seraient à la base dextre, et que le caractère senestre serait apparu polyphylétiquement par la suite, fruit des jeux de mutation.

Chez les Clausiliidés, connu depuis le mésozoïque, le caractère ancestral est clairement l'enroulement senestre, un trait apparu donc très tôt dans l'histoire de cette famille. Cependant, des clausilies dextres sont connues, et représentent clairement un caractère morphologique acquis secondairement et de manière répétée parmi les sous-familles et les genres qui la composent. Ce qui très intéressant, c'est que l'espèce senestre d'origine, qui a généré des populations stables d'individus dextres, est souvent clairement indentifiable comme une image dans un miroir (enantiomorphe). On rencontre alors des cas de populations où le polymorphisme est observé dans une même population ; des cas où les populations dextres et senestres sont vicariantes, dont parfois une seule même espèce a généré plusieurs sous-espèces dextres isolées géographiquement ; et des cas où les populations dextres sont devenues des espèces à part entière. Le fait que le caractère d'inversion de l'enroulement soit relativement fréquent et maintenu dans certaines populations est probablement à mettre en connexion avec la forme allongée de la coquille qui induit moins de contraintes à la copulation d'individus à la chiralité opposée.



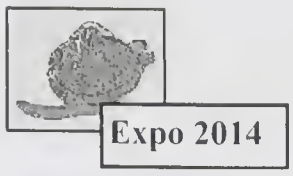
Exemple de deux Enantiomorphes chez *Leucostigma candidescens* (A) (senestre) et la sous-espèce dextre *L. c. paraconvertita* (B) ; et quelques autres exemples de coquilles dextres chez les Clausiidés.; (C) : *Albinaria voithii voithii* ; (D) *Alopia hildegardae fortunata* ; (E) : *Alopia livida livida* ; (F) *Alopia lischkeana obesa* ; (G) : *Sericata dextrosa*.

Marc Alexandre

« France Haliotis »
L'élevage d'ormeaux en pleine mer

Lors de mes vacances d'été, je suis allé rendre visite à Sylvain Huchette propriétaire de la Société « France Haliotis ».
Le site de reproduction d'ormeaux est installé en Bretagne, plus exactement à Kérazan sur la commune de Plouguerneau dans le Finistère Nord. Sur le site, deux zones sont d'importance capitale : « **l'écloserie et la nurserie** ».
Dans l'**écloserie** le naissain est obtenu par accouplements d'ormeaux sauvages *Haliotis tuberculata tuberculata* fournis par les pêcheurs locaux ; ce qui permet de conserver la « carte génétique » de la région. La reproduction se fait en milieu fermé et le naissain va grandir dans ces locaux jusqu'à atteindre environ 200µ.

A cette taille, le naissain est transféré dans la **nurserie**. Elle est située dans un parc extérieur composée de plusieurs grands bassins dans lesquels sont disposés des paniers métalliques accueillants chacun une vingtaine de feuilles de plexiglas destinées à servir de substrat aux jeunes ormeaux. Les ormeaux resteront dans ces bassins jusqu'à atteindre une taille d'environ 2cm. Ils y seront nourri avec des micros algues ou des algues encroûtantes.
A ce stade les ormeaux seront transférés en pleine mer au large du Phare de l'île Vierge dans des cages aménagées à cet effet. Ils seront nourris régulièrement avec des algues fraiches cultivées ou récoltées sur place. Les ormeaux sortiront de ces cages pour être commercialisés vers l'âge de 3 à 5 ans selon la taille obtenue.



Claude Vilvens

Aussi intéressé par la beauté des Pectinidae ...

Pour cette expo 2014, Claude avait choisi de ressortir une partie de sa collection de Pectinidae.

Eh oui, on le sait peu, mais l'amateur de Troques a cédé depuis fort longtemps au charme de ces splendides bivalves !

Cela a été l'occasion pour lui de se replonger un peu dans la systématique de cette famille et il n'a pas été déçu : depuis 10 ans et même plus, de nombreux changements ont été opérés, non seulement dans la classification mais dans l'acceptation ou le rejet de certains genres (le plus souvent d'anciens sous-genres, mais pas toujours) ainsi que dans la mise en synonymie de nom d'espèces pourtant bien connues par ce nom.

En ce qui concerne la systématique des genres et niveaux supérieurs, cela donne en 2014 :

Sous-famille Adamussiinae Habe, 1977
Adamussium Thiele, 1934
Sous-famille Austrochlamydinae Jonkers, 2003
Austrochlamys Jonkers, 2003
Sous-famille Camptonectinae Habe, 1977
Camptonectes Agassiz, 1864
Ciclopecten Seguenza, 1877
Delectopecten Stewart, 1930
Hyalopecten Verrill, 1897
Lyropecten Conrad, 1862
Pseudohinnites Dijkstra, 1989
Sinepecten Schein, 2006
Palliorum Oyama, 1944 (nomen nudum)
Sous-famille Chlamydinae Teppner, 1922
Tribu Chlamydini Teppner, 1922
Azumapecten Habe, 1977
Chlamys Röding, 1798
Complicachlamys Iredale, 1939
Coralichlamys Iredale, 1939
Equichlamys Iredale, 1929
Hemipecten A. Adams & Reeve, 1849
Laevichlamys Waller, 1993
Manupecten Monterosato, 1872
Notochlamys Cotton, 1930
Pascahinnites Dijkstra & Raines, 1999
Scaeochlamys Iredale, 1929
Semipallium Jousseaume, 1928
Swiftopecten Hertlein, 1935
Talochlamys Iredale, 1929
Veprichlamys Iredale, 1929
Zygochlamys Ihering, 1907
Tribu Crassadomini Waller, 1993
Caribachlamys Waller, 1993
Crassadoma F. R. Bernard, 1986
Tribu Fortipectinini Masuda, 1963
Mizuhopecten Masuda, 1963
Patinopecten Dall, 1898
Sous-famille Hemipectininae Habe, 1977
Lamellipecten Dijkstra & Maestrati, 2010

Sous-famille Palliolinae Korobkov, 1960
Lissochlamys Sacco, 1897
Mesopeplum Iredale, 1929
Palliolum Monterosato, 1884
Placopecten Verrill, 1897
Pseudamussium Mörch, 1853
Sous-famille Pectininae Rafinesque, 1815
Tribu Decatopectinini Waller, 1986
Anguipecten Dall, Bartsch & Rehder, 1938
Antillipecten Waller, 2011
Bractechlamys Iredale, 1939
Decatopecten Sowerby II, 1839
Excellichlamys Iredale, 1939
Glorichlamys Dijkstra, 1991
Gloripallium Iredale, 1939
Juxtamusium Iredale, 1939
Mirapecten Dall, Bartsch & Rehder, 1938
Nodipecten Dall, 1898
Tribu Pectinini Rafinesque, 1815
Amusium Röding, 1798
Annachlamys Iredale, 1939
Dentamussium Dijkstra, 1990
Euvola Dall, 1898
Flexopecten Sacco, 1897
Haumea Dall, Bartsch & Rehder, 1938
Leopecten Masuda, 1971
Minnivola Iredale, 1939
Pecten Müller, 1776
Serratovola Habe, 1951
Volachlamys Iredale, 1939
Sous-famille Pedinae Bronn, 1862
Aequipecten P.Fischer, 1886
Argopecten Monterosato, 1889
Cryptopecten Dall, Bartsch & Rehder, 1938
Hinnites Defrance, 1821
Leptopecten Verrill, 1897
Lindapecten Petuch, 1995
Mimachlamys Iredale, 1929
Paraleptopecten Waller, 2011
Pedum Bruguière, 1792
Spathochlamys Waller, 1993

Au registre des synonymes concernant les espèces dont il possède des spécimens, Claude a par exemple fait remarquer que :

- *Chlamys lischkei* Dunker, 1850 est un synonyme de *Zygochlamys patagonica* (King, 1832)
- *Pecten tricarinatus* Anton, 1839 et *Pecten passerinus* Hinds, 1845 sont des synonymes de *Serratovola rubicunda* (Récluz in Chenu, 1843)

Et pour le reste : comme ils sont beaux, comme ils sont variés, comme ils sont colorés ! Peut-être les plus beaux des bivalves ? En tous cas, parmi les plus beaux ☺ !

Merci à tous et à l'année prochaine avec de nouvelles merveilles à découvrir !

Participation malacologique de la S.B.M. au village Natagora le 28 septembre à Namur

Claude VILVENS

Natagora, avec qui la S.B.M. développe de plus en plus de relations tant en Région Wallonne qu'en Région de Bruxelles, est partie prenante dans bon nombre de manifestations. Ainsi, l'association participe au Festival de la photo naturaliste à Namur. A cette occasion, un "village Natagora" a été mis sur pieds dans la cour de l'athénée François Bovesse.

Dans ce village, le stand "Natagora Liège et Basse-Meuse" (dont Johann Delcourt et Claude Vilvens font partie) était exclusivement dédié à la malacologie : avec bien sûr le champ libre pour notre S.B.M. de présenter au public sa toute nouvelle "**Collection S.B.M.**" (voir artcile suivant), ses publications "**Mollusques Terrestres et Dulcicoles de Belgique**" et "**Gastéropodes à coquille communs d'Europe**", ses **posters** (celui des escargots vivants remporte un gros succès), ses "**éventails escargots**" pour s'initier aux escargots courants, et enfin, notre "**quiz malaco**" de 20 questions sur le monde des mollusques (tant marins que terrestres ou d'eau douce), quiz destiné au grand public pour lui permettre de découvrir les merveilles parfois surprenantes de la malacologie.

Le public qui nous a rendu visite a, pour une large part, manifesté de l'intérêt pour nos initiatives, particulièrement le quiz et les "éventails". Une journée donc bien remplie. C'est par ce genre de manifestation qu'une "société savante" comme la nôtre peut espérer se faire connaître: profitons-en chaque fois que c'est possible !

Claude Vilvens

L'écho des réunions

Claude VILVENS

Réunion du 6 septembre 2014 (CV) → **L'atelier "Collection de la S.B.M."**

Un atelier "Collection SBM" avait déjà été organisé il y a quelques temps : l'objectif à l'époque était de rassembler et déterminer les coquilles offertes pas nos membres ou provenant de quelques collections achetée par la S.B.M.

L'atelier du 6 septembre dernier avait pour objectif de passer à l'étape suivante, c'est-à-dire finaliser les boîtes de présentation. Etienne Meuleman et Claude Vilvens avaient déjà consacré deux journées de travail à disposer et fixer les coquilles retenues dans un certain nombre de boîtes, à réaliser un certain nombre d'étiquettes et à découper les couvercles de plastique. Restait à terminer ce travail, à déterminer ce qui devait encore l'être, à ajouter les étiquettes manquantes, à fixer les couvercles préparés – bref, rendre le tout présentable.

Ce fut un bien agréable travail d'équipe, où les déterminations, les tris, les emballages et les coups de foreuse se mêlaient dans une salle de réunion transformée en ruche ;-) Le résultat fut à la hauteur et servit quelques semaines plus tard (voir article précédent) ☺ !

L'écho'quille

Compilation et commentaires de Johann DELCOURT

Gastéropodes terrestres	Clausiliidae	histoire	Ultra-endémisme	News 1

Des descendants romains prisonniers des arènes de Nîmes depuis 2000 ans !

La clausilie romaine (*Leucostigma candidescens*) vit uniquement dans le massif montagneux italien des Apennins. Cependant, Une population est connue en France dans les arènes de Nîmes, et uniquement dans la célèbre ruine du théâtre romain, et ceux depuis qu'un Malacologue l'ait découvert en 1903 ! Les scientifiques supposent très sérieusement que sa présence s'explique par une importation accidentelle il y a 2000 ans lors de la construction des arènes ! Cependant, nous n'avions plus de nouvelles depuis longtemps de cette population, nous laissant supposer que celle-ci avait disparue. Coup de théâtre, c'est le cas de le dire en ces lieux, des individus ont été récemment retrouvés en 2009 dans les étages supérieurs. Le désherbage du site est désormais manuel sans aucun usage de pesticides afin de préserver cette population de clausilie.

Coutagne, G. (1908).Stations disjointes de mollusques terrestres; colonies récemment fondées ou récemment découvertes? *La Feuille des Jeunes Naturalistes*, (4) 38 (448): 84.
Prié, V. and Gargominy, O. (2009). 2000 Ans dans les arènes: une clausilie romaine à Nîmes. 4pp (communiqué de presse du MNHN) http://inpn.mnhn.fr/gargo/Clausilie_romaine_arenes_nimes%20CdP%20MNHN%20.pdf

Gastéropodes terrestres	Carychidae	Ecologie	troglobionte	News 2

Découverte d'un Carychidé vivant à 1000m sous terre en Croatie !

Une nouvelle espèce vivant exclusivement dans les grottes (espèce troglobionte) vient d'être découverte à 980 m sous terre dans la grotte croate de Lukina Jama–Trojama. *Zospeum tholussum* minuscule de 1mm est aveugle et pas du tout pigmenté (complétement transparent dont la coquille), caractéristique fréquente chez les troglobiontes. Cette espèce vit donc totalement dans le noir et à une température assez constante de 3-4°C, sur des surfaces boueuses proches de filet d'eau. L'auteur suppose une dispersion passive possible dans le réseau karstique par le transport de boue par des rivières souterraines temporaires.

Weigand A.M. (2013) New *Zospeum* species (Gastropoda, Ellobioidea, Carychiidae) from 980 m depth in the Lukina Jama – Trojama cave system (Velebit Mts., Croatia). *Subterranean Biology* 11: 45–53

Mollusques	fossiles	paléontologie	cryptochromie	News 3

Cryptochromie de mollusques fossiles révélés par UV

La fossilisation de mollusques nous laisse bien souvent que des coquilles complétement décolorées. Cependant, l'observation de la coquille d'espèces du cénozoïque sous une lumière ultraviolette permet de faire réapparaitre des motifs résiduels insoupçonnés. Les scientifiques ont ainsi mis en évidence que de très nombreuses espèces possédaient toujours des traces résiduelles de cette pigmentation, et que cette technique ouvre de sérieuses perspectives pour améliorer la description des espèces proches alors que l'anatomie interne, le comportement et leur séquence ADN nous sont inaccessibles. Elle pourrait même apporter de nouvelles informations pour les reconstitutions paléo-écologiques.

Caze et al. (2011). Contribution of residual colour patterns to the species characterization of Caenozoic molluscs (Gastropoda, Bivalvia) . *Comptes rendus Palevol* 10:171-179; **Górka, M.** (2008). *Shell colour pattern in two fossil helicid snails, Tropidomphalus incrassatus* (KLEIN, 1853) and WENZ, 1919, from the Middle Miocene of Poland. *Acta Geologica Polonica* **58**, 105-111.

Gastéropodes	terrestres	écologie	chaulage	News 4

Le chaulage forestier a un effet sur l'abondance malacologique

L'abondance en individu et en espèce est bien connu être positivement affectée par un sol à pH élevé et riche en calcium. Par contre, lorsqu'une forêt connait une acidification, cette abondance malacologique et la richesse générale de la forêt diminue sensiblement. Un moyen de restaurer celle-ci est de pratiquer un épandage de chaux. Dans une forêt américaine de Pennsylvanie, une étude met évidemment en évidence que le chaulage a pour effet de remonter le pH, et d'accroitre significativement la concentration en calcium et magnésium. Mais elle met surtout clairement en évidence un effet positif sur l'abondance en mollusques durant les trois premières années qui suivent le chaulage, avec une augmentation continue chaque année des populations. Par contre, à la cinquième année, les populations retournent à leur niveau initial. Cette étude montre aussi une augmentation des populations d'oiseaux. Les auteurs avancent que cette meilleure santé des populations aviennes serait directement liée à l'abondance de proies que constituent les mollusques.

Pabian et al. (2012). Terrestrial Liming As a Restoration Technique for Acidified Forest Ecosystems. *International Journal of Forestry Research* 2012, Article ID 976809, 10 pages.

Gastéropodes terrestres	Helicidae, Hygromiidae	éthologie	odorat	News 5

Trois de nos espèces soumises au test de l'olfactomètre : trouver la nourriture par l'odorat

Theba pisana, *Cernuella virgata* et *Cochlicella acuta* sont des espèces à tendance ouest-méditerranéenne qui se rencontrent en Belgique essentiellement dans les dunes côtières. Actuellement, ces trois espèces européennes s'observent dans bien d'autres endroits du monde où elles sont devenues invasives. Et c'est notamment le cas en Australie où des recherches sont engagées pour tenter de contrôler leurs populations. Dans ce contexte, les chercheurs australiens ont tenté de déterminer si ces espèces étaient capables d'être attirées par des odeurs potentiellement attractives (20 réponses pour chacune des 22 substances testés). Dans un dispositif appelé olfactomètre, un individu doit faire le choix entre deux chemins, dont l'un conduit à une source émettant des odeurs de nourriture. Ce genre de dispositif fonctionne par exemple pour attirer des petit-gris *Cornu aspersum* avec des odeurs de carotte, démontrant la pertinence du dispositif. Les résultats semblent indiquer que ce n'est pas le cas pour nos trois espèces, celles-ci trouvant la nourriture aléatoirement. Cependant, *T. cernuella* et *C. virgata* peuvent marquer une préférence significative mais pas parfaite vers l'odeur de laitue s'ils ont été déjà été conditionnés à celle-ci, mais pas à l'odeur de céleri ou de carotte. *C. acuta* par contre évite le plus souvent l'odeur de pellettes molluscicides. Cette étude montre que l'attraction par l'odeur n'est pas une voie fructueuse pour élaborer une technique de contrôle des populations de ces espèces sur le terrain.

Baker et al. (2012) Are the European snails, *Theba pisana* (Müller, 1774) (Helicidae), *Cernuella virgata* (da Costa, 1778) and *Cochlicella acuta* (Müller, 1774) (Hygromiidae) attracted by potential food odours? *Crop Protection* **42**, 88-93

Leucostigma candidescens

Quelques nouvelles publications

Claude VILVENS

Die Landschnecken Deutschlands

par **Vollrath Wiese**

Editions Quelle & Meyer Verlag Wiebelheim 352 pages – toutes illustrations couleurs Couverture dure, 11 x 18 cm	**ISBN** : 978-3-494-01551-4 **Prix :** 20.00 EUR + port

Comme le titre le laisse à penser, il s'agit ici d'un livre au format "guide de terrain" qui balaie l'ensemble des mollusques terrestres d'Allemagne, pays proche du nôtre s'il en est.

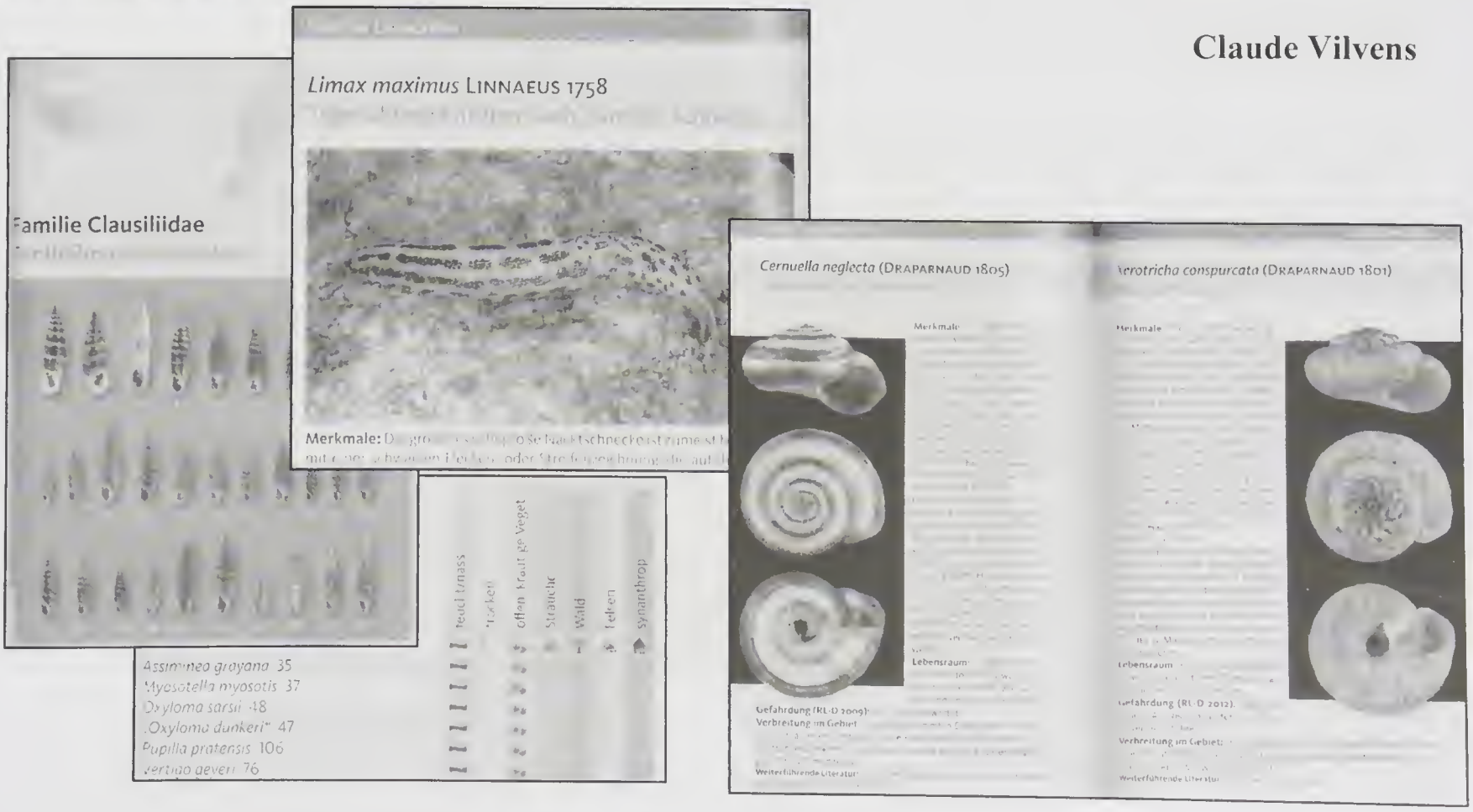
Et en fait, cet ouvrage passe en revue bon nombre de mollusques de Belgique ! Et c'est évidemment là un gros intérêt de ce livre, qui est remarquablement bien fait : texte descriptif assez court, mais donnant l'essentiel pour déterminer l'espèce considérée, avec le petit détail qui permet de faire la différence avec une espèce apparentée !
Quant aux illustrations, elles sont excellentes : très bonne qualité, 3 vues pour tous les terrestres à coquille où c'est nécessaire, limaces présentées in situ.
Bien sûr, c'est aussi l'occasion de découvrir des escargots et limaces que l'on peut trouver en Allemagne lors de ses voyages. Et de (re)découvrir que même en Europe, certaines espèces rares sont menacées ☹

Il est vrai que connaître l'allemand peut aider à appréhender ce livre ;-) Mais, en fait, une connaissance rudimentaire suffit, après avoir fait l'effort de chercher quelques mots de vocabulaire : toutes les descriptions sont coulées dans le même moule.

Un superbe livre que l'on ne m'a pas offert pour que j'en assure la promotion ; je n'ai tout simplement pas hésité à me l'offrir sur le site de Conchbooks. Et je peux affirmer que ce livre vaut son prix, ce qui est rare de nos jours ;-) !

Un cadeau de fin d'année ;-) ?

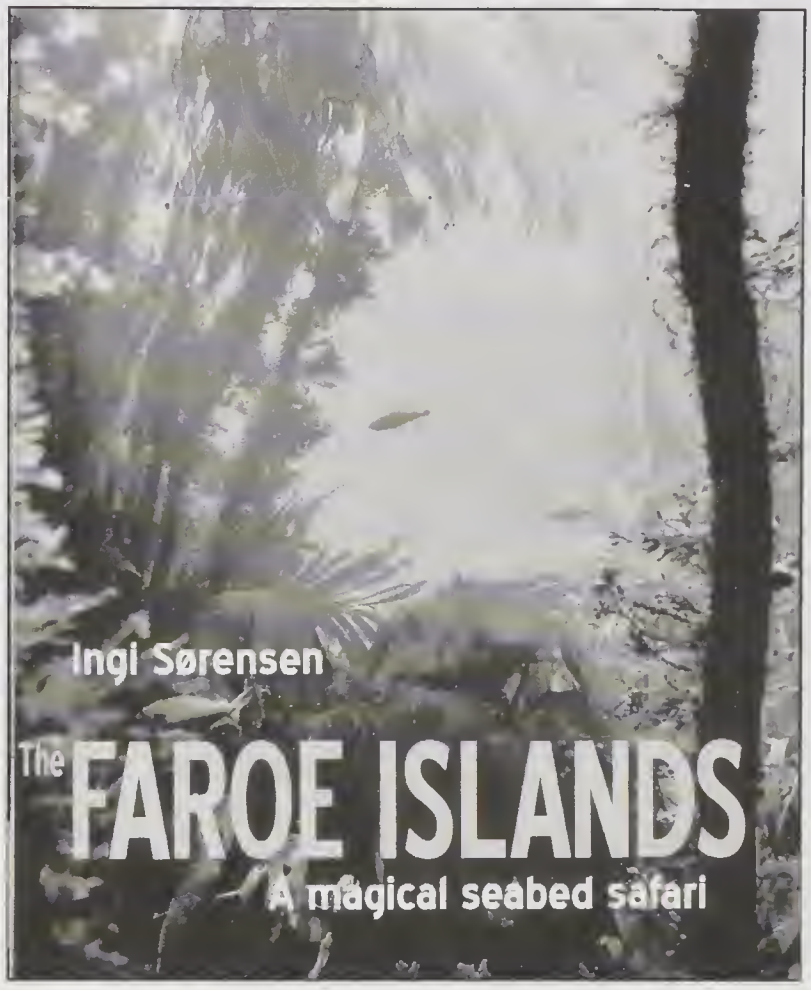
Claude Vilvens



The Faroe Islands
A magical seabed safari

par **Ingi Sørensen**

Editeur: Ingi Sørensen and Prenta, Thorshavn, Faroe Islands 2013 184 pages	H.N. Jacobsens Bókahandil hnj@hnj.fo 500 DKK



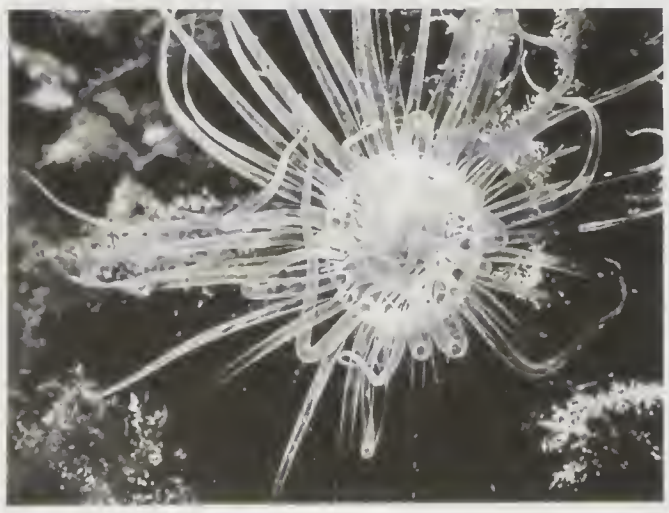
Comment qualifier cet ouvrage quelque peu atypique : inédit, envoûtant et mystérieux. Il s'agit d'un livre de 184 feuillets composé de photos sous-marines en pleine page avec des médaillons qui s'entrelacent pour le bonheur des yeux de celui qui découvre les fonds marins des Iles Féroé.

Le lieu est en soi inédit, peu d'ouvrages abordent les fonds de l'Atlantique Nord-Est que des préjugés pourraient nous faire paraître gris, sans couleur ou inintéressant. C'est en fait tout le contraire. L'auteur passioné de photographies sous-marines nous enmène au cœur des forets d'algues dont les stipes se dressent tels le fût des chênes en forêt de Brocéliande. Ce ne sont ni des enchanteurs, ni des fées qui hantent ces lieux, mais tout un monde de vertébrés et d'invertébrés plus étranges les uns que les autres. Si l'on y découvre des fleurs, ce sont des anémones de mer aux couleurs chatoyantes. Si l'on y voit des animaux plus familiers, ce sont des échinodermes, des mollusques, des crustacés ou des poissons aux couleurs et aux formes les plus invraissemblables. Tout est baigné d'une lumière bleue ou verte qui donne des couleurs automnales aux champs de laminaires. Point de mousse sur le sol, mais des sables merveilleux, lumineux, et brillants, constellés de pierres vivantes faites d'algues calcaires encroûtantes multicolores ornées de cnidaires et de bryozoaires. Pas un cm² n'est inoccupé, l'œil a peine à y reconnaître tout ce qui y vit.

Livre atypique, car quasi dépourvu de texte, sans pagination, ni légendes, ni noms latins ou vernaculaires, donc sans besoin d'index. Deci delà les photos révèlent l'une ou l'autre citation laconique qui doit nous ouvrir les yeux et l'esprit pour nous faire comprendre combien il est important de respecter et de protéger les fonds marins de notre planète.

Voilà donc un ouvrage à feuilleter, une fois, dix fois avant d'avoir le sentiment d'y avoir vu l'essentiel et l'envie de recommencer pour y découvrir les détails au cœur d'autres détails…

Roland Scaillet



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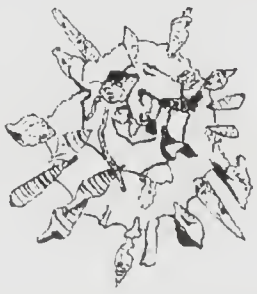

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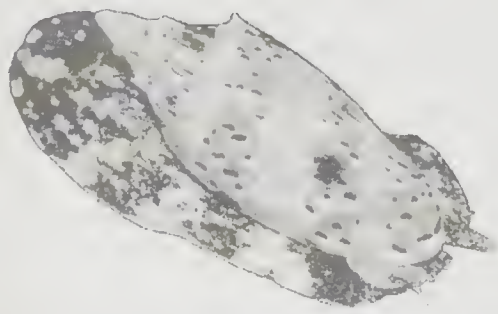

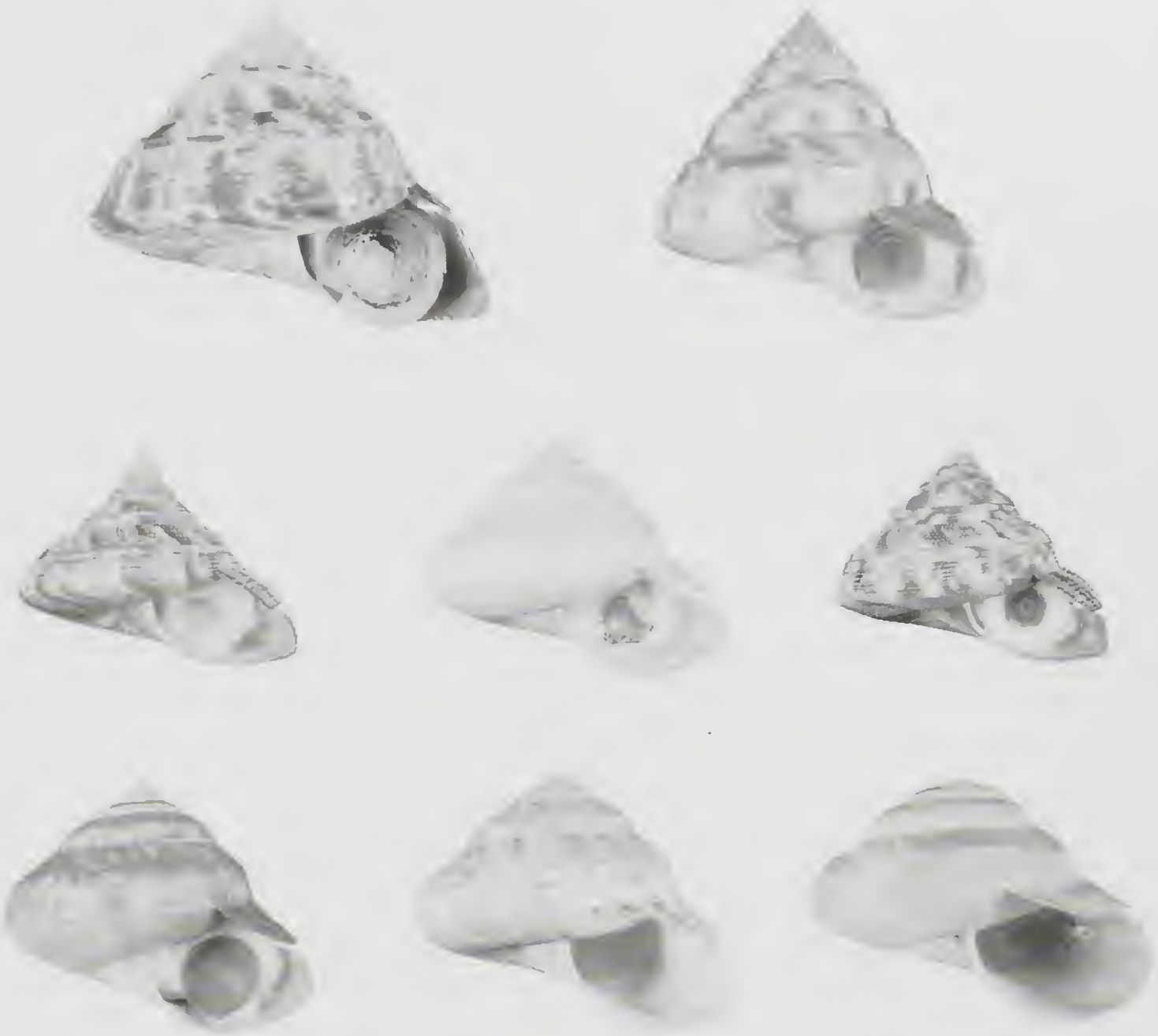

E. [illegible] adansonianus (Crosse & Fischer, 1861), Bahamas, 106.1 mm. *M. anseeuwi* (Kanazawa & Goto, 1991), Philippines, 111.4 mm. *P. [illegible]* & Askew, 1993, USA, 42 mm. *B. tangaroana* (Bouchet & Metivier, 1982), New Zealand, 55.9 mm. *P. quoyanus* (Fischer & Bernardi, 1856), Curaçao, 50.7 mm. *B. philpoppei* Poppe Anseeuw & Goto, 2006, Philippines, 65.1 mm. *B. charlestonensis* Askew, 1987, Martinique, 77.3 mm. *B. midas* (Bayer, 1965), Bahamas, 82.7 mm.

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Grandes marées de l'année 2015

Christiane DELONGUEVILLE et Roland SCAILLET

015, marée exceptionnelle de coefficient 119 à ne pas manquer ! On peut véritablement parler de la marée du r et septembre connaitront aussi de beaux coefficients : 118 et 117 respectivement.

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Mercredi 21	103 - 106
	Jeudi 22	109 - 109
	Vendredi 23	109 - 107
	Samedi 24	104 - (99)

Février	Mercredi 18	(96) - 103
	Jeudi 19	109 - 113
	Vendredi 20	**116 - 118**
	Samedi 21	117 - 115
	Dimanche 22	111 - 106

Mars	Jeudi 19	(97) - 105	
	Vendredi 20	110 - 115	
	Samedi 21	**118 - 119**	Exceptionnel !
	Dimanche 22	**118 - 115**	
	Lundi 23	111 - 105	

Avril	Vendredi 17	(95) - 101
	Samedi 18	106 - 110
	Dimanche 19	112 - 113
	Lundi 20	112 - 109
	Mardi 21	105 - 100

Mai	Dimanche 17	(97) - 100
	Lundi 18	101 - 102
	Mardi 19	101 - (99)

Juin	-	-

Juillet	-	-

Août	Samedi 1	(99) - 103
	Dimanche 2	105 - 106
	Lundi 3	106 - 104
	Mardi 4	101 - (97)
	Samedi 29	(95) - 101
	Dimanche 30	107 - 111
	Lundi 31	113 - 114

Septembre	Mardi 1	114 - 111
	Mercredi 2	107 - 102
	Dimanche 27	(98) - 105
	Lundi 28	110 - 114
	Mardi 29	**117 - 117**
	Mercredi 30	116 - 113

Octobre	Jeudi 1	108 - 102
	Lundi 26	(97) - 103
	Mardi 27	108 - 111
	Mercredi 28	113 - 113
	Jeudi 29	112 - 109
	Vendredi 30	104 - (98)

Novembre	Mercredi 25	(99) - 102
	Jeudi 26	104 - 104
	Vendredi 27	104 - 102

Décembre	-	-

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REFERENCE :

Annuaire des Marées pour 2015 - Ports de France - Métropole - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Brest - 258 p.*

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New species and new records of Calliostomatidae (Gastropoda: Trochoidea) from Madagascar

Claude VILVENS

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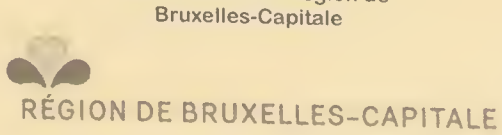

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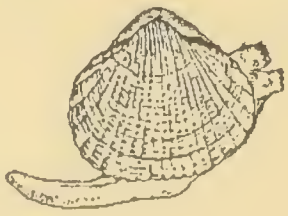

New species and new records of Calliostomatidae (Gastropoda: Trochoidea) from Madagascar

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Scientific Collaborator, Muséum national d'Histoire naturelle, Paris.
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KEYWORDS. Gastropoda, Calliostomatidae, Madagascar, *Calliostoma*, *Dactylastele*, *Carinastele*, new species.

ABSTRACT. New records of 4 known Calliostomatidae species from Madagascar area are listed, extending the distribution area of some of them. 9 new species are described and compared with similar species: *Calliostoma madatechnema* n. sp., *C. textor* n. sp., *C. parvajuba* n. sp., *C. hematomenon* n. sp., *C. subalboroseum* n. sp., *C. tumidosolidum* n. sp., *C. pyrron* n. sp., *C. herberti* n. sp. and *Carinastele wareni* n. sp.

RESUME. De nouveaux relevés de 4 espèces connues de Calliostomatidae provenant de la région de Madagascar sont listés, étendant ainsi l'aire de distribution d'un certain nombre d'entre elles. 9 nouvelles espèces sont décrites et comparées avec des espèces similaires : *Calliostoma madatechnema* n. sp., *C. textor* n. sp., *C. parvajuba* n. sp., *C. hematomenon* n. sp., *C. subalboroseum* n. sp., *C. tumidosolidum* n. sp., *C. pyrron* n. sp., *C. herberti* n. sp. et *Carinastele wareni* n. sp.

INTRODUCTION

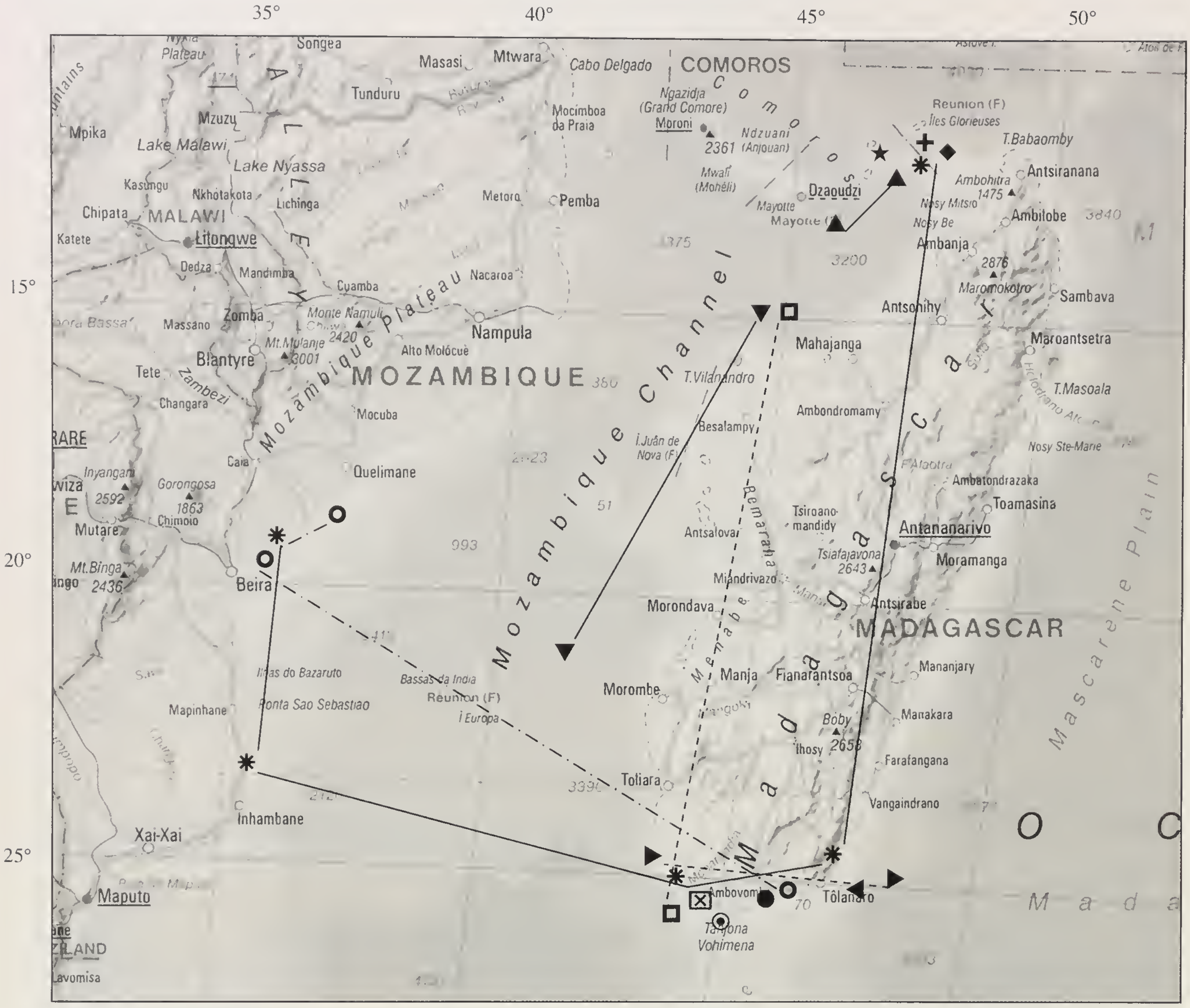
Up these last years, the fauna of the western and south-western parts of the Indian Ocean remained poorly known, except the malacofauna of South Africa, for which rather numerous, more or less recent books (e.g. Kensley, 1973; Kilburn & Rippey, 1982 ; Steyn & Lussi, 1998) and numerous papers are available, especially for Trochoidea (e.g. Herbert, 1987; 1990; 1992; 1993; 1995).

With the aim to perform a large survey of the biodiversity of some of these unexplored areas, and more generally around the indo-pacific area, a campaigns program called "La Planète Revisitée" (French sentence meaning "Our planet reviewed"), with special attention to invertebrates, was built based upon a partnership between the Muséum national d'Histoire naturelle of Paris, the non-governmental organization Pro-Natura International (PNI) and the International Union for Conservation of Nature (IUCN).

The present paper is based on material from the Madagascar region brought by three of these biodiversity surveys conducted in southwestern Indian Ocean, especially along Mozambique Channel and Madagascar : MAINBAZA, MIRIKY and ATIMO

VATAE. These campaigns conducted from April 2009 to June 2010, with the collaboration of additional local partners as the Institut Halieutique et des Sciences Marines (IHSM) and the Madagascan Office of the Wildlife Conservation Society (see www.laplaneterevisitee.org).

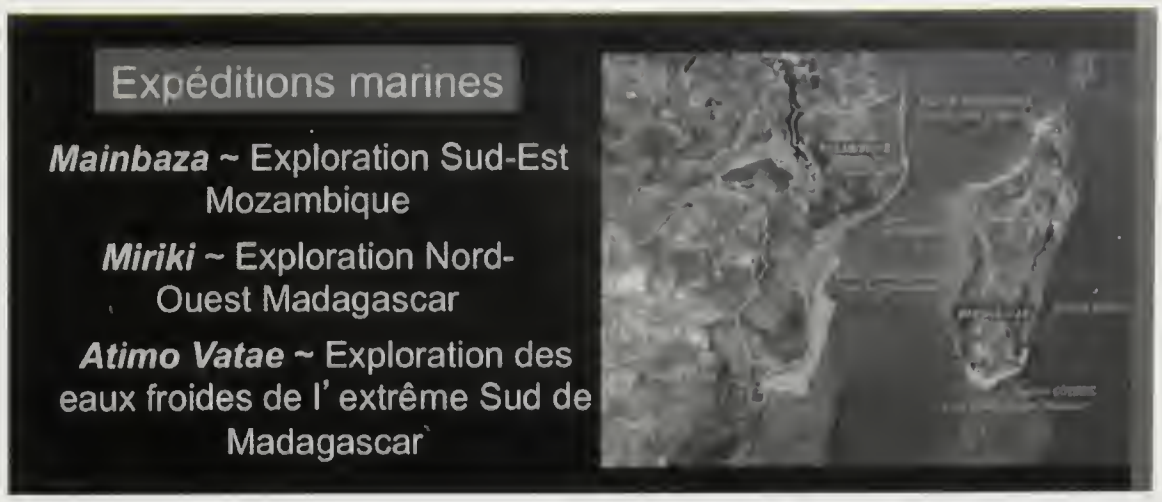
This paper focus on Calliostomatidae species. Among the studied material, 9 species are new to science whereas 4 other ones are known species but with some extension of their distribution.



Map 1 : Records of cited Calliostomatidae species in Madagascar area :

✱ *Calliostoma madatechnema* n. sp. (MIRIKY, ATIMO VATAE, MAINBAZA)
✚ *C. textor* n. sp. (MIRIKY)
● *C. parvajuba* n. sp. (ATIMO VATAE)
★ *C. hematomenon*n. sp. (MIRIKY)
⦿ *C. subalboroseum* n. sp. (ATIMO VATAE)
◆ *C. tumidosolidum* n. sp. (MIRIKY)
◻ *C. pyrron* n. sp. (MIRIKY, ATIMO VATAE)
○ *C. herberti* n. sp. (ATIMO VATAE)
⊠ *Carinastele wareni* n. sp. (ATIMO VATAE)

▲ *Calliostoma madagascarense* Vilvens, Nolf & Verstraeten, 2004 (MIRIKY)
◀ *C. crossleyae* E.A.Smith, 1910 (ATIMO VATAE)
▼ *C. muriellae* Vilvens, 2001 (MIRIKY)
▶ *Dactylastele burnupi* (E.A. Smith, 1899) (ATIMO VATAE)



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Material and methods

The material studied in the present paper was brought mainly by two IRD-MNHN expeditions: MIRIKY (6-7/2009) and ATIMO VATAE (5/2010). Additional material used for comparison was brought mostly by the MAINBAZA (4/2009) campaign, but also by P 1, P 2, P 3, P 4 (1971) and BENTHEDI (1977) ORSTOM-MNHN trawlings.

Other additional material was provided by the Natal Museum (courtesy D.G. Herbert) : it was mainly dredged by R.V. Meiring Naudé (RVMN, 6/1987) and NMDP (6/1990) campaigns, some specimens coming from legged old collections.

Regarding the distribution of the new species and the extension of the distribution of known species, the known bathymetric range is given as the interval between the two extreme values of all the recorded depth ranges (i.e. MIN depth is the largest value of the minimum values of all the recorded ranges and MAX depth is the lowest value of the maximum values of all the recorded ranges, thus the final bathymetric distribution interval is the highest value MIN depth – MAX depth). This range of the known and new species is provided for all the available specimens and also for the only living specimens if they have been found; when these ranges are the same, the common range is cited once with the "(living)" annotation; if all the specimens are dead collected, the range is cited with the "(dead)" annotation.

Regarding the description methodology, the main conchological features used are (see Figure 1 below):

- general shape of the shell : conical, cyrtoconoidal, coeloconoidal;
- relative height of the spire : spire depressed or depressed;
- size and shape of the protoconch;
- shape of the whorls : convex, concave, straight; with or without shoulder or keel;
- spiral cords of the whorls : onthogeny, number, granular (beaded) or smooth, distance between cords;
- shape of the aperture, features of the outer and the inner lip.
- shape of the base and its spiral cords : number, granular (beaded) or smooth, distance between cords;
- features of the umbilicus : open or covered with a callus, relative size, with a rounded or carinate edge, with a smooth or granular carina, spiral cords around or inside umbilicus;
- columella : thickened or not;
- colour pattern of the protoconch, of the whorls, of the base.

Abbreviations

Repositories

IMT: Institute of Malacology of Tokyo, Tokyo, Japan.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
NHMUK: Natural History Museum of United Kingdom, London, England.
NMSA: KwaZulu-Natal Museum, Pietermaritzburg, South Africa.
SMNH: Swedish Museum of Natural History, Stockholm, Sweden.

Shell features and dimensions
H: height
HA: height of the aperture
P1, P2,: primary cords (P1 is the most adapical)
Pi: group of the three first primary cords (i=1,2,3)
S1, S2,: secondary cords (S1 is the most adapical)
Si: group of the secondary cords
T1, T2,: tertiary cords (numbered following appearing order)
TW: number of teleoconch whorls
W: width

Other abbreviations

stn: station
lv: live-taken specimens present in sample
dd: no live-taken specimens present in sample
sub: subadult specimen
juv: juvenile specimen
o.d.: original designation
s.d.: subsequent designation

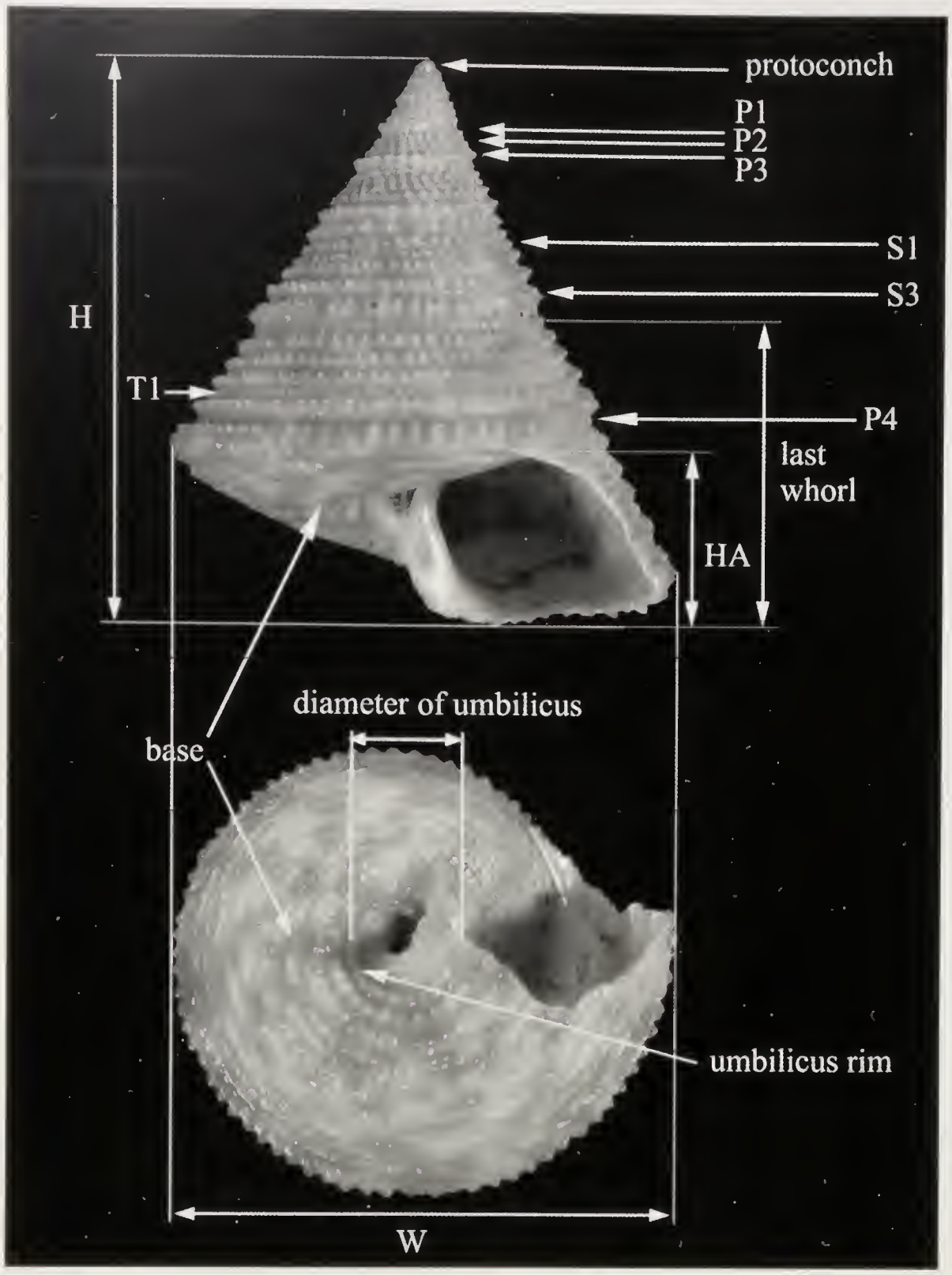


Figure 1. Principal conchological features of Calliostomatidae shells; H : height; W : width; HA : height of the aperture; P1, P2, P3, ... : primary cords; S1, S2, S3, ... : secondary cords; T1, T2, ... : tertiary cords (shell : *Calliostoma pyrron* n. sp., 11.8 x 10.5 mm).

SYSTEMATICS

We follow here Marshall (1995a), Bouchet & Rocroi (2005) and Williams et al. (2008, 2010) where Calliostomatidae, earlier treated as a subfamily of Trochidae (Hickman & McLean, 1990), are now ranked as a family of superfamily Trochoidea, with the two subfamilies Calliostomatinae and Thysanodontinae.

Regarding subgenera of the genus *Calliostoma*, it has been decided to not use them here, because they seem today rather artificial considering the information brought by DNA studies. One can however refer to Marshall (1995b) regarding Indo-Pacific subgenera and to Clench & Turner (1960) regarding Atlantic subgenera.

Superfamily **TROCHOIDEA** Rafinesque, 1815
Family **CALLIOSTOMATIDAE** Thiele, 1924
Subfamily **CALLIOSTOMATINAE** Thiele, 1924
Tribe **Calliostomatini** Thiele, 1924 [= Ziziphininae Gray, 1847]
Genus ***Calliostoma*** Swainson, 1840
Type species: *Trochus conulus* Linnaeus, 1758 (by s.d. Herrmannsen, 1846) – Recent, Mediterranean Sea.

Calliostoma madagascarense
Vilvens, Nolf & Verstraeten, 2004
Figs 2–6

Calliostoma (Kombologion) madagascarensis Vilvens, Nolf & Verstraeten, 2004: 49-55, figs 1-6. Type locality: North-western Madagascar, 400-410 m.

Material examined. Western Madagascar. MIRIKY: stn CP3183, 12°38'S, 48°14'E, 420-436 m, 1 dd, 4 lv sub. – Stn CP3184, 12°40'S, 48°12'E, 492-524 m, 5 lv, 2 lv sub. – Stn CP3200, 12°06'S, 48°54'E, 560-653 m, 1 lv. – Stn CP3210, 12°44'S, 48°12'E, 442-491 m, 5 lv, 1 dd sub. – Stn CP3223, 12°46'S, 48°11'E, 430-488 m, 6 lv, 4 dd sub, 1 dd juv. – Stn CP3284, 14°51'S, 46°59'E, 236-297 m, 1 lv. – Stn CP3285, 14°47'S, 46°58'E, 512-680 m, 1 lv. – Stn CP3289, 14°29'S, 47°26'E, 332-379 m, 1 lv. – Stn CP3290, 14°29'S, 47°26'E, 409-425 m, 2 dd.

Distribution. Western Madagascar (integrating data for the same area of Vilvens et al., 2004), living at 297-560 m.

Remarks. The main characteristics of this species are:
– height up to 30 mm, width up to 40 mm;
– shell rather thin and light relative to its size,
–moderately high spire, coeloconoidal shape, angular periphery, with up to 8 whorls;
– protoconch about 500 μm wide, of 1 whorl;
– teleoconch with granular spiral cords; P2 and P3 appearing first while P1 appears half a whorl later, S1 and S2 appearing on fourth whorl and additional tertiary cords appearing on next whorls; about 16-20 cords on last whorls
– an almost flat base, concave in its peripheral quarter, weakly convex for inner part, with about 30 granular spiral cords, all smooth except the 4 or 5 inner cords which are granular;
– anomphalous;
– pink-apricot colour, P4, S4 and base paler.
This handsome species seems to be often confused with *C. scotti* Kilburn, 1973 (Figs 7-11) but this species is mainly heavier with a much thicker shell and has a fully convex base.

Calliostoma madatechnema n. sp.
Figs A, 16–24, Table 1

Type material. Holotype (17.8 x 21.0 mm) MNHN IM-2000-27738. Paratypes: 7 MNHN IM-2000-27739, 1 coll. C.Vilvens CV2014- CP3189.

Type locality. Western Madagascar, MIRIKY, stn CP3189, 12°30'S, 48°18'E, 346-376 m.

Material examined. Western Madagascar. P 1: chalutage 1, 12°53'S, 48°09'E, 480-520 m, 1 dd. – Chalutage 2, 12°53'S, 48°09'E, 480-520 m, 1 dd. – Chalutage 5, 12°45'S, 48°11'E, 563-570 m, 1 dd. – P 2: chalutage 10, 12°45'S, 48°15'E, 300-340 m, 6 lv. – Chalutage 12, 12°42'S, 48°14'E, 395-405 m, 1 lv. – Chalutage 13, 12°41'S, 48°16'E, 308-314 m, 1 dd. – P 3: chalutage 17, 12°38'S, 48°16'E, 335-370 m, 1 lv. – Chalutage 28, 12°43'S, 48°12'E, 445-455 m, 3 lv. – Chalutage 41, 12°43'S, 48°13'E, 350-360 m, 1 dd. – P 4: chalutage 43, 15°24'S, 46°02'E, 250-265 m, 1 dd. – MIRIKY: stn CP3182, 12°36'S, 48°16'E, 331-364 m, 10 lv, 3 lv juv. – Stn CP3188, 12°31'S, 48°22'E, 298-301 m, 4 lv, 1 dd sub. – Stn CP3189, 12°30'S, 48°18'E, 346-376 m, 50 lv, 1 dd juv (with holotype, 7 paratypes MNHN IM-2000-27739, 1 paratype CV2014- CP3189). – Stn CP3197, 12°07'S, 48°58'E, 362-431 m, 1 dd, 1 dd juv. – Stn CP3198, 12°05'S, 48°59'E, 440-447 m, 1 dd. – Stn CP3215, 12°32'S, 47°54'E, 316-433 m, 1 dd. – Stn CP3217, 12°33'S, 48°56'E, 391-438 m, 3 lv. – ORSTOM, 12°43'S, 48°15'E, 300-340 m, 2 lv.
Southern Madagascar. ATIMO VATAE: stn DW3515, 24°53'S, 47°28'E, 184-203 m, 2 dd sub. – Stn DW3527, 24°23'S, 47°32'E, 305-313 m, 1 dd juv. – Stn DW3586, 25°33'S, 44°18'E, 155-156 m, 1 dd juv.
Mozambique Channel. MAINBAZA: stn CC3131, 25°56'S, 33°07'E, 193-194 m, 1 dd juv. – Stn CC3143, 23°32'S, 35°46'E, 264-277 m, 6 dd, 4 dd sub, 1 dd juv. – Stn CC3151, 19°34'S, 36°45'E, 352-357 m, 4 dd juv.

Distribution. Western Madagascar, 265-563 m, living at 301-445 m; Mozambique Channel, 194-352 (dead); Southern Madagascar, 156-305 (dead).

Diagnosis. A rather tall *Calliostoma* species, with a moderately elevated, coeloconoidal spire, up to 14 granular, close spiral cords, the most abapical cord the strongest, an almost flat base with up to 15 granular spiral cords, without umbilicus; light brownish orange with irregular brown patches and beads of cords white.

Description. *Shell* of medium size for the genus (height up to 18.7 mm, width up to 21.8 mm), wider than high, conical to weakly coeloconoidal in shape; spire elevated, height 0.8 x to 0.9 x width, 3.3x to 3.8x aperture height; angulate periphery; widely umbilicate.
Protoconch about 320 to 350 μm wide, of 1 whorl, rounded, covered by a network of ridges producing large polygonal areas; thin, poorly visible terminal varix.
Teleoconch of up to 7.9 almost flat to weakly convex whorls, except more convex last whorl.
Suture poorly visible, not canaliculate.
First whorl convex, sculptured by rather thick, axial, almost orthocline ribs and 3 spiral cords P1, P2 and P3 appearing almost simultaneously; P3 quickly slightly stronger than other cords; distance between cords

similar in size to cords; axial ribs making the cords granular; distance between ribs 1.5 times larger than width of ribs; suture visible, not canaliculate. Second whorl only weakly convex, with P3 stronger than other cords, P4 partly visible, almost completely hidden by succeeding whorl; distance between P1 and P2 smaller than other distances between cords; axial ribs prosocline; suture poorly visible. Third whorl almost flat with P3 much stronger with sharp beads, producing keel between middle and 2nd third of whorl; P1 weaker, but slightly stronger than P2; P4 fully or partially visible, as strong as P1; axial ribs still strong, distance between ribs 2 times larger than width of ribs. On fourth whorl, beads of all cords pointed; axial ribs between P3 and P4 thicker than other cords. On fifth whorl, P4 as strong as P3; keel weakening and finally disappearing; axial ribs much weaker, except between P3 and P4. On sixth whorl, P4 the strongest, S1 and S2 appearing, S2 about half a whorl later, all quickly granular; S3 absent; T1 appearing between suture and P1, quickly similar to S1 and S2. On last whorls, additional thin, smooth Ti appearing between P3 and P4; all spiral cords less pointed, but still granular. On last whorl, P4 peripheral; angular periphery.

Aperture subquadrangular; outer lip rather thin, curved, with a basal part rounded, meeting inner lip with rounded angle.

Columella slightly oblique, curved, thickened in abapical part.

Base weakly convex to almost flat, with about 15 spiral cords; outer cords smooth, distance between cord similar to thickness of cords; median and inner cords thicker, closer, made granular by fine axial threads; cord bordering umbilicus nearly smooth.

Umbilicus wide (about 20 to 25% of shell width), funnel shaped, with angulate rim; neither threads nor cords inside.

Colour of teleoconch globally light brownish orange: whitish ground colour with irregular brown patches; beads of cords white; P4 with regular brown patches covering two or three beads and separated by four or five brownish orange coloured beads; base nacreous white; protoconch white.

	TW	H	W	HA	H/W	H/HA
holotype	7.8	17.8	21.0	5.1	0.85	3.49
paratype 1	7.9	18.7	21.8	5.1	0.86	3.67
paratype 2	7.7	17.2	20.3	5.1	0.85	3.37
paratype 3	7.8	16.7	20.2	4.9	0.83	3.41
paratype 4	7.8	17.1	19.4	4.5	0.88	3.80
paratype 5	7.7	17.3	20.0	5.2	0.87	3.33
paratype 6	7.8	17.2	19.8	4.9	0.87	3.51
paratype 7	7.7	17.0	20.2	5.1	0.84	3.33
paratype CV	7.8	17.4	20.6	4.8	0.84	3.63
means	7.8	17.4	20.4	5.0	0.9	3.5

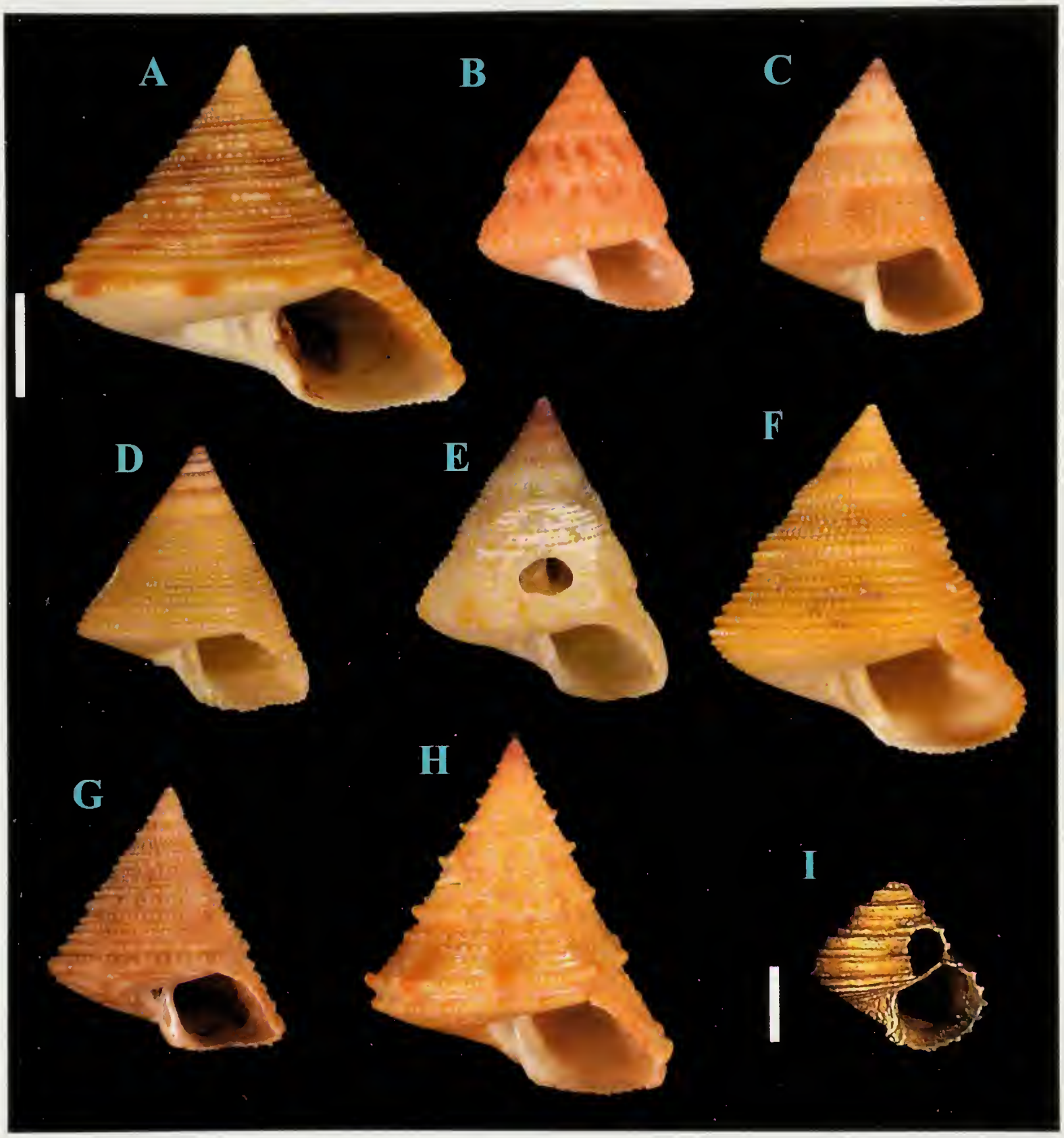
Table 1. - *Calliostoma madatechnema* n. sp. : Shells measurements in mm for types.

Discussion. *Calliostoma madatechnema* n. sp. seems to be rather variable regarding the height and the concavity of the spire. This handsome new species is rather close to *C. iridescens* Sowerby, 1903 (Figs 12-15) from South Africa, but the latter species has a different secondary spiral cords ontogeny, with S1 and S2 appearing much earlier at the end of the fourth whorl and much more numerous tertiary cords appearing on the last whorls; moreover, the cords of the South African species are smooth except P1 and the tertiary above it, and all the cords between P1 and P4 are much thinner than those of the new species; finally, *C. iridescens* has always a light brown base (not uniformly nacreous white), with irregular brownish flames and spiral segments on the cords.

Etymology. Work of art (Ancient Greek: τεχνημα) – referring to the fine granular sculpture of the spiral cords, used as a noun in apposition with a prefix referring to the type locality.

Figures A-I [(scale bars: 5 mm (A-H); 1 mm (I)]

Calliostoma new species from Madagascar area, all MNHN holotypes. **A.** *C. madatechnema* n. sp.; **B.** *C. textor* n. sp.; **C.** *C. parvajuba* n. sp.; **D.** *C. hematomenon* n. sp.; **E.** *C. subalborosenm* n. sp.; **F.** *C. tumidosolidum* n. sp.; **G.** *C. pyrron* n. sp.; **H.** *C. herberti* n. sp; **I.** *Carinastele wareni* n. sp.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Calliostoma textor n. sp.
Figs B, 25–32, Table 2

Type material. Holotype (11.5 x 9.7 mm) MNHN IM-2000-27740. Paratypes: 2 MNHN MNHN IM-2000-27741, 1 MNHN IM-2000-27742, 1 coll. C.Vilvens CV2014-CP3285.

Type locality. Western Madagascar, MIRIKY, stn CP3204, 12°37'S, 48°30'E, 59-60 m.

Material examined. Western Madagascar. MIRIKY: stn CP3204, 12°37'S, 48°30'E, 59-60 m, 3 lv (holotype MNHN IM-2000-27740 and 2 paratypes MNHN IM-2000-27741). – Stn CP3205, 12°38'S, 48°26'E, 60-63 m, 4 dd. – Stn CP3244, 14°55'S, 46°55'E, 58-87 m, 1 dd. – Stn CP3285, 14°47'S, 46°58'E, 512-680 m, 2 dd (paratype MNHN IM-2000-27742 and paratype CV2014-CP3285).

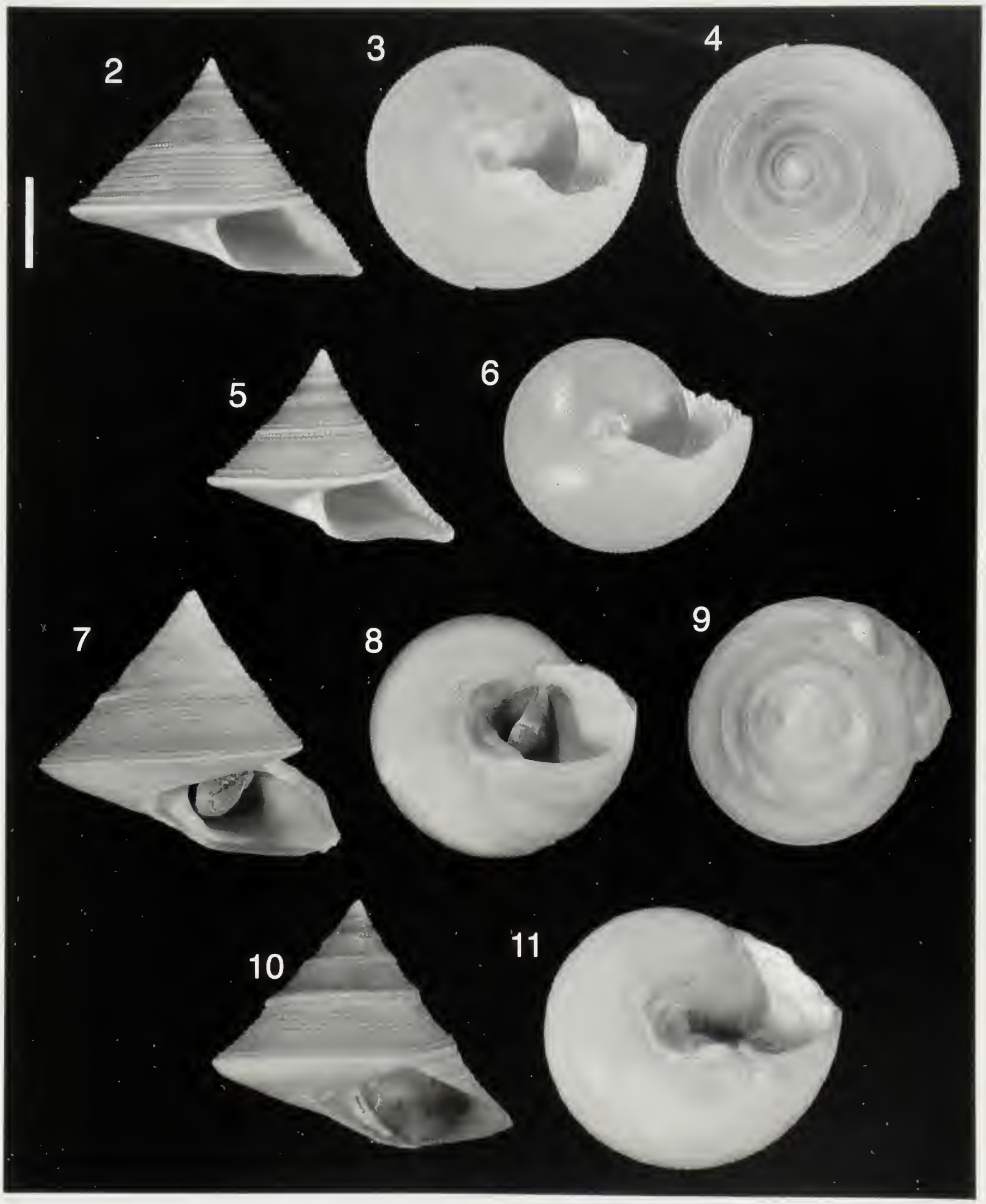
Distribution. Western Madagascar, 60-512 m, living at 59-60 m.

Diagnosis. A typical *Calliostoma* species of moderate size, with an elevated, conical spire, up to 14 granular, closely packed spiral cords, the two most abapical cords stronger, an almost flat base with up to 14 granular spiral cords, without umbilicus; pinkish orange with brown subsutural flames and brown coloured spiral band between the cords, the two peripheral cords with alternating brown and pink segments.

Description. *Shell* of medium size for the genus (height up to 15.6 mm, width up to 12.7 mm), higher than wide, conical to weakly cyrtoconoidal in shape; spire elevated, height 1.2x to 1.3x width, 3.5x to 3.8x aperture height; subangulate periphery; anomphalous.
Protoconch about 200 μm wide, of 1 whorl, rounded, dome-shaped, covered by a reticulate network; apical fold straight with a thin rounded terminal varix.
Teleoconch of up to 9.6 weakly convex to more or less flat whorls. Suture poorly visible, not canaliculate.
First whorl convex, sculptured by thick axial, almost orthocline ribs and 3 spiral cords P1, P2 and P3 appearing immediately, granular by intersection with axial threads; distances between cords smaller than distance between higher or lower cord to nearby suture; interspace between threads 1.5x to 2x larger than threads; P1 slightly stronger than other cords; suture visible, not canaliculate. On second whorl, cords similar in strength; P4 emerging from suture, partly hidden by succeeding whorl; P1 and P3 moving towards suture, making all cords and suture evenly spaced; axial threads broader and more prosocline, connecting beads of cords; suture poorly visible. On third whorl, S1 appearing at beginning of whorl; bead of cords well rounded, not sharp, well separated; axial threads weakening. On fourth whorl, P3 and P4 closer, almost without interspace between them; S2 appearing; beads of cords more rounded and closer packed; axial threads weak but still present. On fifth whorl, tertiary cords appearing by intercalation between Pi and Si; P1 and P3 stronger than other cords, P3 the strongest, peripheral. On last whorls, number of cords growing up to 10 to 14 cords; cords close, granular, more or less similar in size except P3 slightly stronger; distance between cords larger on adapical part than on abapical part; prosocline axial threads more visible, strong between suture and P1.
Aperture subquadrangular, slightly horizontally elongated on large specimens; outer lip rather thin, curved, with a basal part rounded, producing an obtuse angle at meeting point with inner lip.
Columella oblique, nearly straight with a weak median swelling; callus completely covering umbilicus.
Base weakly convex, almost flat, with 11 to 14 granular, close packed spiral cords; cords stronger in area bordering umbilicus.
Colour of teleoconch pinkish orange with brown subsutural flames; on second and third whorl, all cords brown coloured, darker than interspaces; on two or three next whorls, cords pink with brown coloured spiral band in interspaces; on last whorls, brown bands possibly replaced by brown axial flames on adapical part; on all whorls except the two early ones, P4 and P3 with regular brown patches covering one to three beads and separated by one to three pink coloured beads; base lighter; first half of protoconch reddish brown, second half light brown.

Figures 2-11 (scale bar: 10 mm)

2-6. ***Calliostoma madagascarense*** Vilvens, Nolf & Verstraeten, 2004, Western Madagascar, 406-410 m [MIRIKY, stn CP3223]. **2-4.**, 26.2 x 31.1 mm; **5-6.** 17.6 x 22.8 mm.
7-11. ***Calliostoma scotti*** Kilburn, 1973.
7-9. Mozambique Channel, 406-410 m [MAINBAZA, stn CC3163], 34.1 x 33.9 mm; **10-11.** South Africa, Natal, off Durban, 35 m, C.Vilvens coll., 30.1 x 37.0 mm.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	TW	H	W	HA	H/W	H/HA
holotype	8.0	11.5	9.7	2.4	1.19	4.79
paratype MNHN IM-2000-27741	8.5	13.4	10.6	3.5	1.26	3.83
paratype MNHN IM-2000-27741	7.9	11.5	9.8	3.3	1.17	3.48
paratype MNHN IM-2000-27742	9.6	15.6	12.7	3.8	1.23	4.11
paratype CV	8.0	12.1	10.1	3.0	1.20	4.03
means	8.4	12.8	10.6	3.2	1.21	4.05

Table 2. - *Calliostoma textor* n. sp. : Shells measurements in mm for types.

Discussion. *Calliostoma textor* n. sp. is rather close to *C. scobinatum* (A.Adams *in* Reeve, 1863) (Figs 33-34) from eastern Indian Ocean and western Indo-Pacific, but the latter species, although more or less similar in size and colour, has a very different spiral cords ontogeny, with, among others, S3 present and appearing earlier than other secondary cords.
The colour pattern of P3 and P4 of *C. textor* n. sp. resembles *C. africanum* Bartsch, 1915 (Figs 35-37) from South Africa, but the latter species, similar in size, has flat whorls, spiral cords with bigger beads, P3 subgranular and P4 smooth, an open umbilicus partly covered by a columellar callus and a more convex base with smooth or subgranular spiral cords.
The new species may be compared to *Dactylastele burnupi* (E.A. Smith, 1899) (Figs 104-114) from South Africa, but this similar in size species has more convex whorls, thicker and less numerous spiral cords on the whorls and on the base, with only P4 (not P3) streaked in brown and white.
The new species may also be compared to *C. alisi* Marshall, 1995 (Figs 38-39) from Loyalty Islands, but this similar in size and shape species has a spiral cord S3 that is the strongest cord, an axial sculpture still visible on last whorls and less numerous, thicker spiral cords on the base.

Etymology. Weaver (Latin: textor) used in apposition as a noun – referring to the regular, fine granular sculpture and coulour pattern on the whole surface of the whorls and the base.

Calliostoma parvajuba n. sp.
Figs C, 40–42

Type material. Holotype (13.8 x 11.3 mm) MNHN IM-2000-27743.

Type locality. Southern Madagascar, ATIMO VATAE, stn CP3549, 25°17'S, 46°31'E, 53-54 m.

Material examined. Only known from type material.

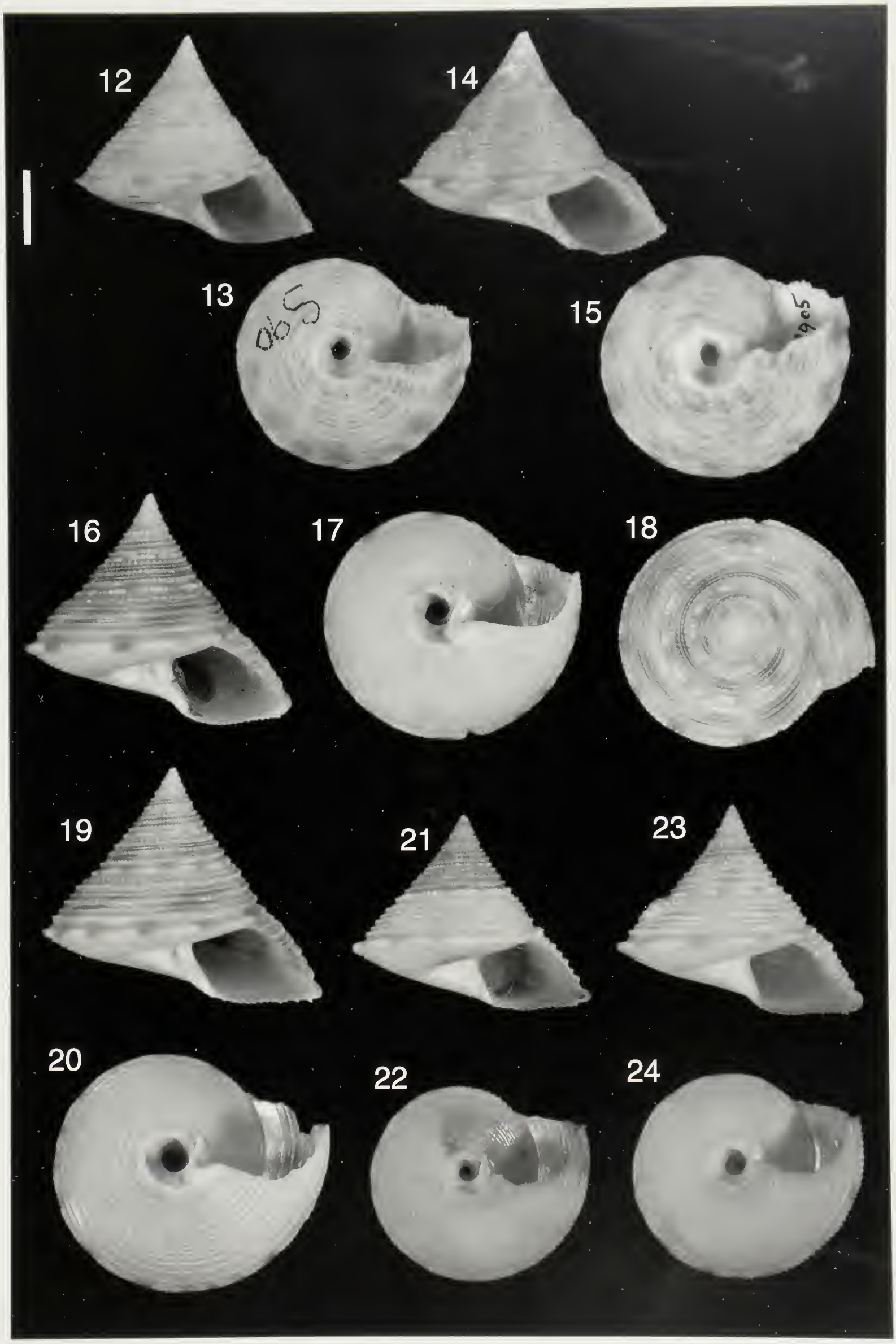
Distribution. Southern Madagascar, 53-54 m (dead).

Diagnosis. A typical *Calliostoma* species of medium size, with an elevated, conical spire, up to 12 granular spiral cords, a stronger, sharp pointed suprasutural spiral cord on the median whorls, a very weakly convex, almost flat base with 16 granular spiral cords and a very narrow umbilicus; early teleoconch whorls pinkish mauve, other whorls nacreous white with axial brownish flames.

Description. *Shell* of medium size for the genus (height up to 13.8 mm, width up to 11.3 mm), higher than wide, conical; spire elevated, height 1.2x width, 3.4x aperture height;
angulate periphery; very narrowly umbilicate.
Protoconch about 300 μm wide, of 1 whorl, rounded, partly eroded, with spiral and strong axial threads producing reticulate network; apical fold straight without visible varix.

Figures 12-24 (scale bar: 5 mm)

12-15. ***Calliostoma iridescens*** Sowerby, 1903, Natal.
12-13. 100 m [NMDP, stn ZV10], 15.5 x 17.7 mm (NMSA S90); **14-15.** off Durban, 100 m [RVMN, stn XX112], 17.5 x 21.5 mm (NMSA D3905).
16-24. ***Calliostoma madatechnema*** n. sp., Western Madagascar.
16-20. 346-376 m [MIRIKY, stn CP3189]; **16-18.** Holotype MNHN IM-2000-27738, 17.8 x 21.0 mm; **19-20.** Paratype MNHN IM-2000-27739, 18.7 x 21.8 mm; **21-22.** 300-340 m [P 2, Chalutage 12], 14.3 x 16.9 mm; **23-24.** 563-570 m [P 1, Chalutage 12], 14.9 x 17.6 mm.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Teleoconch of up to 8.1 weakly convex to more or less flat whorls. Suture poorly visible, not canaliculate.
First whorl convex, sculptured by thick axial, almost orthocline ribs and 3 cords P1, P2 and P3 appearing immediately, evenly spaced, nodular by intersection with axial threads; interspace between ribs about 2x larger than ribs; P3 the strongest, with blunt pointed nodules; P2 slightly weaker than P3; P1 much weaker than other cords; suture visible, not canaliculate. On second whorl, P4 emerging from suture, nearly smooth, much weaker than other cords, close to suture; nodules of both P3 and P2 pointed, nodules of P3 stronger than nodules of P2; axial ribs broader and slightly prosocline, connecting beads of cords; thin axial threads appearing between ribs; thin spiral threads appearing between P3 and P4, producing reticulate pattern. On third whorl, P3 the strongest, with pointed beads; S1 appearing, very thin, quickly granular as P1. On fourth whorl, beads of P3 sharply pointed and P3 producing a temporary carina; S2 appearing, smooth, thickening very slowly; S1 slightly thinner than P1 and P2; axial threads weak but still present between all cords; spiral threads between P3 and P4 no more visible. On fifth whorl, nodules of P3 only bluntly pointed; P1, S1, P2 similar in size, P3 slightly stronger, P4 thickening, similar in size to S2. On next whorls, number of cords growing up to 12 cords by intercalation of tertiary cords; P4 peripheral; cords granular, more or less similar in size; beads of cords horizontally elongated; distance between cords similar in size to cords; some weak, prosocline threads visible between cords.
Aperture rounded subquadrangular; outer lip thin, curved, with strong angle, producing an obtuse angle at meeting point with inner lip.
Columella slightly oblique, straight, with a basal thickening.
Base very weakly convex, almost flat, with 16 granular spiral cords; distance between cords smaller than cords.
Umbilicus very narrow (about 7% of shell width), funnel shaped, without angulate rim.
Colour of early teleoconch whorls pinkish mauve; next whorls nacreous white with brownish axial flames, enlarging on last whorls, with small brown spots between beads of spiral cords; base yellowish brown, umbilical area lighter, almost white; protoconch pink.

Discussion. *Calliostoma parvajuba* n. sp. is rather close to *C. textor* n. sp. (Figs 25–32) from Western Madagascar, but the latter species, similar in size, has a smaller protoconch (200 μm instead of 300 μm), more convex whorls, P3 and P2 being always granular (not pointed), spiral cords closer with more rounded beads, a subangulate periphery and lacks the narrow, funnel shaped umbilicus.

Etymology. Small crest (Latin: parvus, a, um; juba), used in apposition as a noun – referring to the spiral cord P3 making a temporary keel on the median whorls.

Calliostoma hematomenon n. sp.
Figs D, 43–48

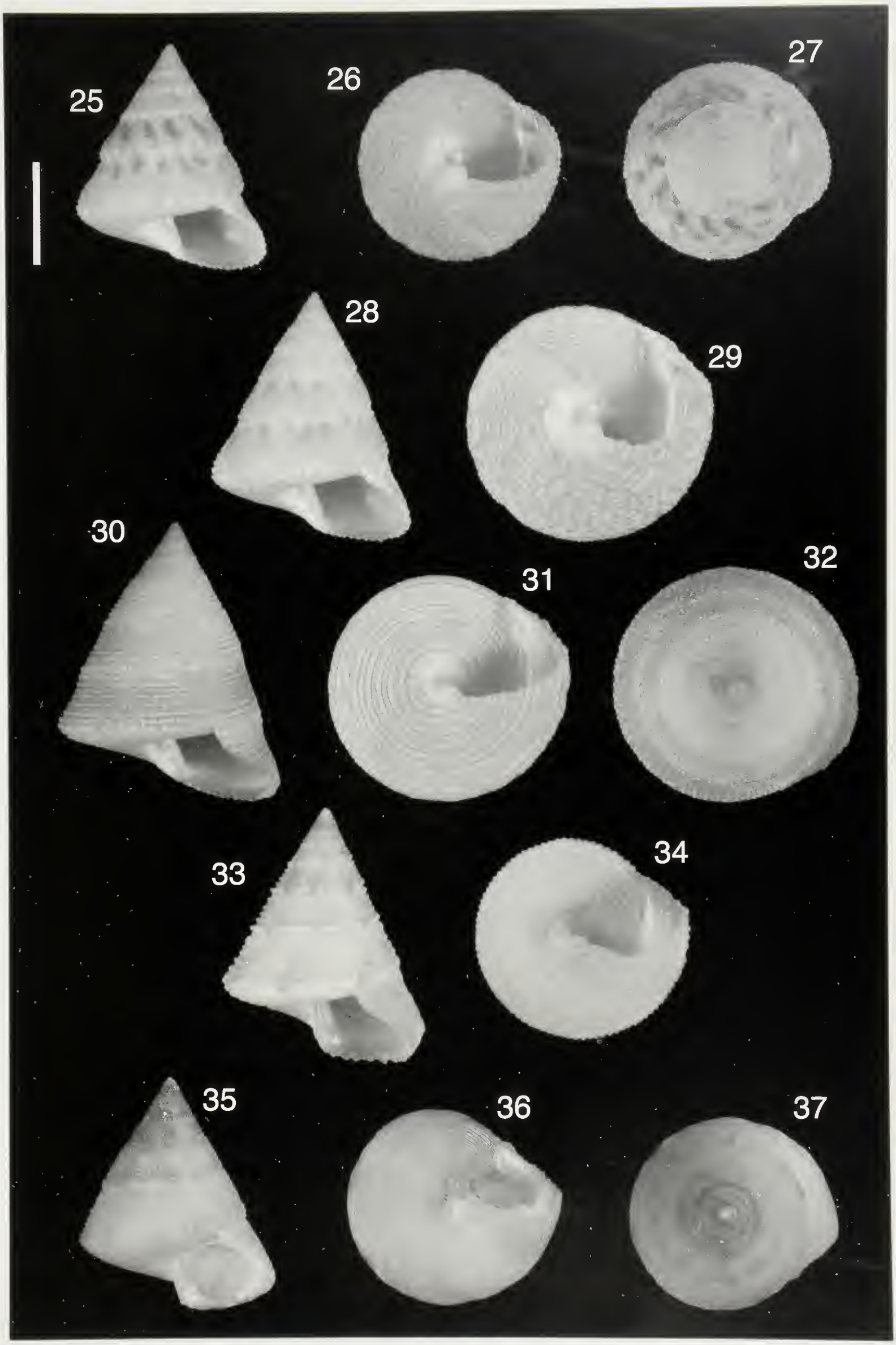
Type material. Holotype (11.9 x 10.5 mm) MNHN IM-2000-27744. Paratype (13.1 x 12.2 mm) MNHN IM-2000-27745.
Type locality. Western Madagascar, MIRIKY, stn DW3213, 12°31'S, 47°52'E, 262-289 m.

Material examined. Western Madagascar. MIRIKY: stn DW3196, 12°08'S, 48°56'E, 238-249 m, 1 dd sub. – Stn DW3213, 12°31'S, 47°52'E, 262-289 m, 1 lv (holotype IM-2000-?????). – Stn CP3262, 15°34'S, 45°44'E, 227-283 m, 1 dd (paratype IM-2000-?????).
Mozambique Channel. MAINBAZA: stn CC3159, 23°55'S, 35°37'E, 148-152 m, 1 dd sub.

Distribution. Western Madagascar, 249-262 m, living at 262-289 m; Mozambique Channel, 148-152 m (dead).

Diagnosis. A typical nacreous white *Calliostoma* species with dark pink spiral areas on early whorls, of moderate size, with an elevated, conical spire, an angulate periphery, up to 9 main granular, similar in size spiral cords on the last whorl with thin subgranular cords between them, a flat to almost concave base with up to 15 subgranular spiral cords, without umbilicus.

Figures 25-37 (scale bar: 5 mm).
25-32. ***Calliostoma textor*** n. sp., Western Madagascar.
25-27. Holotype MNHN IM-2000-27740, 59-60 m [MIRIKY: stn CP3204], 11.5 x 9.7 mm; **28-29.** Paratype MNHN IM-2000-27741, 59-60 m [MIRIKY, stn CP3204], 13.4 x 10.6 mm; **30-32.** Paratype MNHN IM-2000-27742, 512-680 m [MIRIKY, stn CP3285], 15.6 x 12.8 mm.
33-34. ***Calliostoma scobinatum*** (A.Adams *in* Reeve, 1863), Philippines, Aliguay, 13.7 x 11.4 mm.
35-37. ***Calliostoma africanum*** Bartsch, 1915, South Africa, Natal, Park Rynie, C.Vilvens coll., 11.6 x 9.7 mm.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Description. *Shell* of medium size for the genus (height up to 13.1 mm, width up to 12.2 mm), higher than wide, conical in shape; spire elevated, height 1.1x width, 3.7x to 4.1x aperture height; angulate periphery; anomphalous.
Protoconch from 250 to 300 μm wide, of 1 whorl, rounded, covered by a strong reticulate network; apical fold straight with a thin, poorly visible, rounded terminal varix.
Teleoconch of up to 7.3 flat whorls. Suture poorly visible, not canaliculate from third whorl.
First whorl convex, sculptured by axial, almost orthocline ribs and 3 evenly spaced cords P1, P2 and P3 appearing immediately, granular by intersection with axial threads; interspace between threads 1.5x larger than threads; P3 stronger than other cords; suture visible, slightly canaliculate. On second whorl, cords and ribs stronger; P3 the strongest, with bluntly pointed beads, producing a weak keel; P1 and P2 granular, with rounded, separate beads. On third whorl, S1 and S2 appearing at beginning of whorl, as strong as P2 at end of whorl; P1 slightly stronger than P2; axial threads more prosocline; P4 partly emerging from suture at end of whorl; suture no more canaliculate. On fourth whorl, P1 and P4 almost as strong as P3; beads of P3 almost rounded, closer to each other; axial ribs weakening. On fifth whorl, all cords similar in size with rounded beads; T1 and T2 appearing respectively between P1 and S1 and between P3 and P4, thin, subgranular; axial sculpture obsolete. On sixth whorl, T1 and T2 almost similar in size to other cords; S4 emerging partially from suture. On last whorls, additional tertiary cords appearing by intercalation, very thin; P4 and S4 peripheral; cords close, granular, more or less similar in size, distance between cords smaller than cords.
Aperture subquadrangular; outer lip rather thin, curved, with a basal part rounded, producing a round angle with outer lip and an obtuse angle with inner lip. Columella oblique, nearly straight with possibly weak median swelling; callus completely covering umbilicus.
Base flat with up to 15 subgranular, low spiral cords, cords in umbilical area stronger; distance between cords similar in size to cords; very weak axial threads between cords.
Colour of teleoconch basically pinkish beige; on the four early whorls, P1 and abapical area below P3 dark pink; last whorls and base uniformly coloured; base nacreous white, without dots; protoconch pink.

Discussion. *Calliostoma hematomenon* n. sp. is close to *C. textor* n. sp. (Figs 25–32) from the same area, but the letter species, similar in size, has a different colour pattern (brown lines between cords, P3 and P4 streaked in pink and light brown), a P3 cord similar to the other primary cords on the first whorls but becoming stronger and peripheral on the next whorls (it is the contrary of the here described species) and a more convex base (it is strictly flat to almost concave for the here described species) with higher, closer, more granular spiral cords and a larger umbilical area.

Etymology. Bloody (Ancient Greek : ηματωμενος, η, ον) - with reference to dark pink spiral bands on the first whorls.

Calliostoma subalboroseum n. sp.
Figs E, 49–51

Type material. Holotype (13.3 x 11.2 mm) MNHN IM-2009-13637.

Type locality. Southern Madagascar, south of Faux-Cap, ATIMO VATAE, stn DW3553, 26°08'S, 45°39'E, 280-333 m.

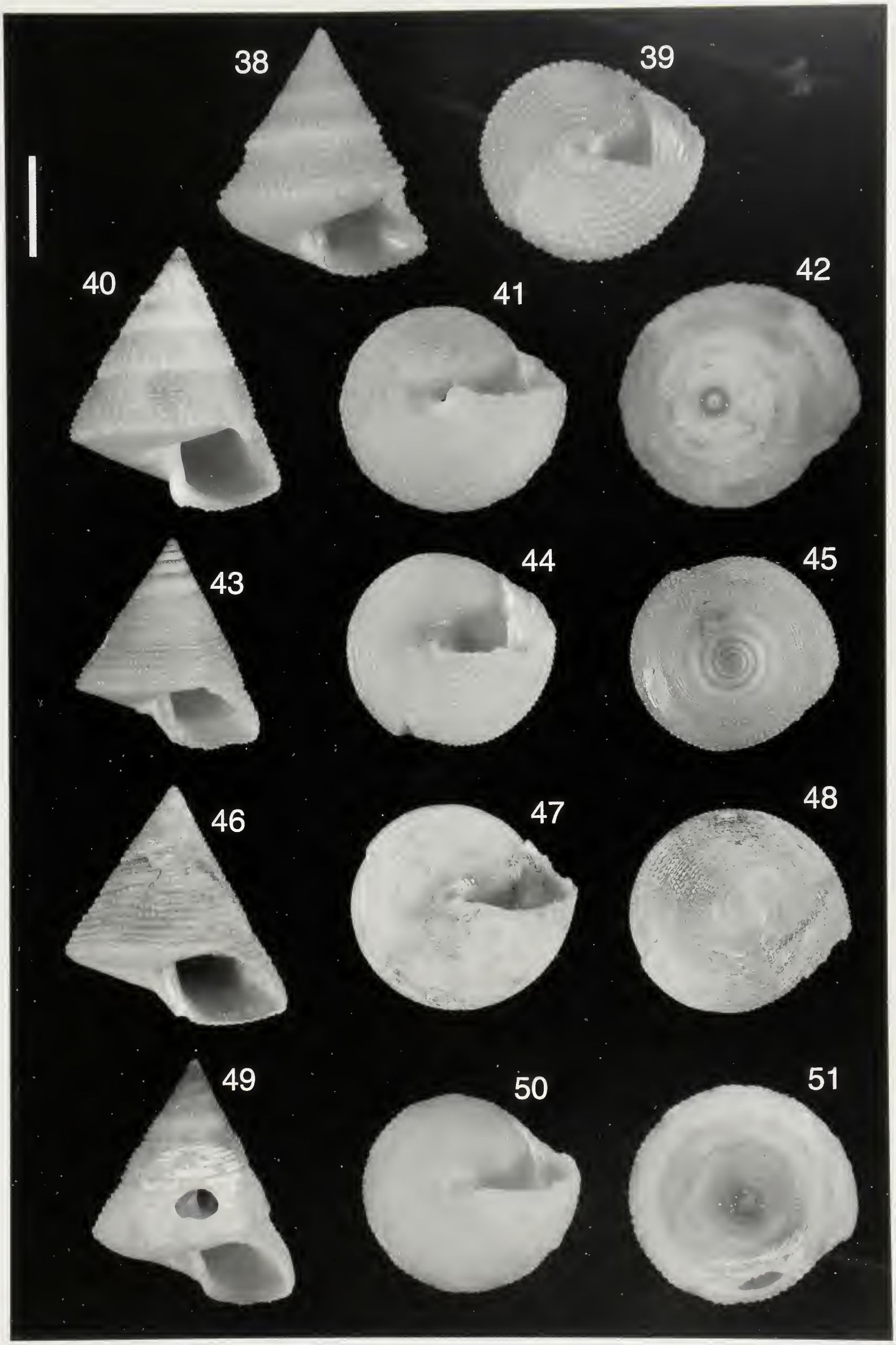
Material examined. Only known from type material (living, molecular sample performed MNHN-2009-13637).

Distribution. Southern Madagascar, living at 280-333 m.

Diagnosis. A typical, medium in size, nacreous white *Calliostoma* species with first whorls dark pink, with an elevated, conical spire, an angulate periphery, up to 8 main granular on the last whorl, similar in size except the suprasutural one always stronger, a weakly convex base with 12 subgranular spiral cords, without umbilicus.

Figures 38-51 (scale bar: 5 mm)

38-39. ***Calliostoma alisi*** Marshall, 1995, paratype MNHN, Loyalty Islands, 430 m [MUSORSTOM 6, stn CP464], 13.7x12.0 mm.
40-42. ***Calliostoma parvajuba*** n. sp., Southern Madagascar, holotype MNHN IM-2000-27743, 53-54 m [ATIMO VATAE: stn CP3549], 13.8 x 11.3 mm.
43-48. ***Calliostoma hematomenon*** n. sp., Western Madagascar.
43-45. Holotype MNHN IM-2000-27744, 262-289 m [MIRIKY, stn DW3213], 11.9 x 10.5 mm; **46-48.** Paratype MNHN IM-2000-27745, 227-283 m [MIRIKY, stn CP3262], 13.1 x 12.2 mm.
49-51. ***Calliostoma subalboroseum*** n. sp., holotype MNHN IM-2009-13637, 280-333 m [ATIMO VATAE, stn DW3553], 13.3 x 11.2 mm.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Description. *Shell* of medium size for the genus (height up to 13.3 mm, width up to 11.2 mm), higher than wide, conical in shape; spire elevated, height 1.2x width, 4.0x aperture height; angulate periphery; anomphalous.
Protoconch about 300 μm wide, of 1 whorl, rounded, covered by a strong reticulate network; apical fold straight with a rounded terminal varix.
Teleoconch of up to 7.8 slightly convex whorls. Suture hard to distinguish, not canaliculate.
First whorl convex, sculptured by axial, rather thin, almost orthocline ribs; P3 and P2 appearing immediately, P1 a quarter of whorl later; cords evenly spaced, granular by intersection with axial threads; interspace between threads 2x larger than threads; P3 quickly stronger than other cords. On second whorl, cords and ribs stronger; P3 still the strongest; all cords with rounded beads; area between P3 and suture concave in shape. On third whorl, S1 and S3 appearing; axial ribs more prosocline. On fourth whorl, P3 still the strongest but P1 and S3 almost as strong as P3, stronger than other cords; beads of P1, P2, P3 and S3 blunt pointed; S2 appearing; axial sculpture obsolete. On fifth whorl, S3 the strongest, filling the concave in shape suprasutural area; T1 and T2 appearing respectively between P1 and S1 and between P3 and S3, thin, subgranular; P4 emerging from suture, thin, nearly smooth. On last whorls, all these cords becoming similar in size, except S3 the strongest and P4 very weaker; distance between cords similar in size to cords; additional tertiary cords appearing by intercalation.
Aperture subelliptical; outer lip rather thin, curved, with a basal part rounded, producing a round angle with outer lip and an obtuse angle with inner lip.
Columella oblique, nearly straight with weak median swelling, completely covering umbilicus but leaving an umbilical depression.
Base very weakly convex, with about 12 subgranular, low spiral cords; distance between cords similar in size to cords; very weak axial threads between cords.
Colour of teleoconch basically nacreous white : 3 early whorls dark pink, 4th red, other whorls white with red or orange blotches; base completely white; protoconch pink.

Discussion. *Calliostoma subalboroseum* n. sp. is highly characterized by its spiral cord S3 always stronger than all other cords. It may be compared to *C. hematomenon* n. sp. (Figs 43–48) from western Madagascar, but the latter species, similar in size, has flat whorls, a slightly lower height/width ratio, the beads of the spiral cords much more rounded, no prominent S3 and a clearly flat base without umbilical depression.

Etymology. Pink and whitish (Latin : albus, a , um; roseus, a, um; sub as prefix) - with reference to the colour of the shell, with pink first whorls and whitish last whorls.

Calliostoma tumidosolidum n. sp.
Figs F, 52–54

Type material. Holotype (17.5 x 16.1 mm) MNHN - 2000-27746.

Type locality. Western Madagascar, MIRIKY, stn CP3231, 12°24'S, 47°57'E, 435-600 m.

Material examined. Only known from type material (living).

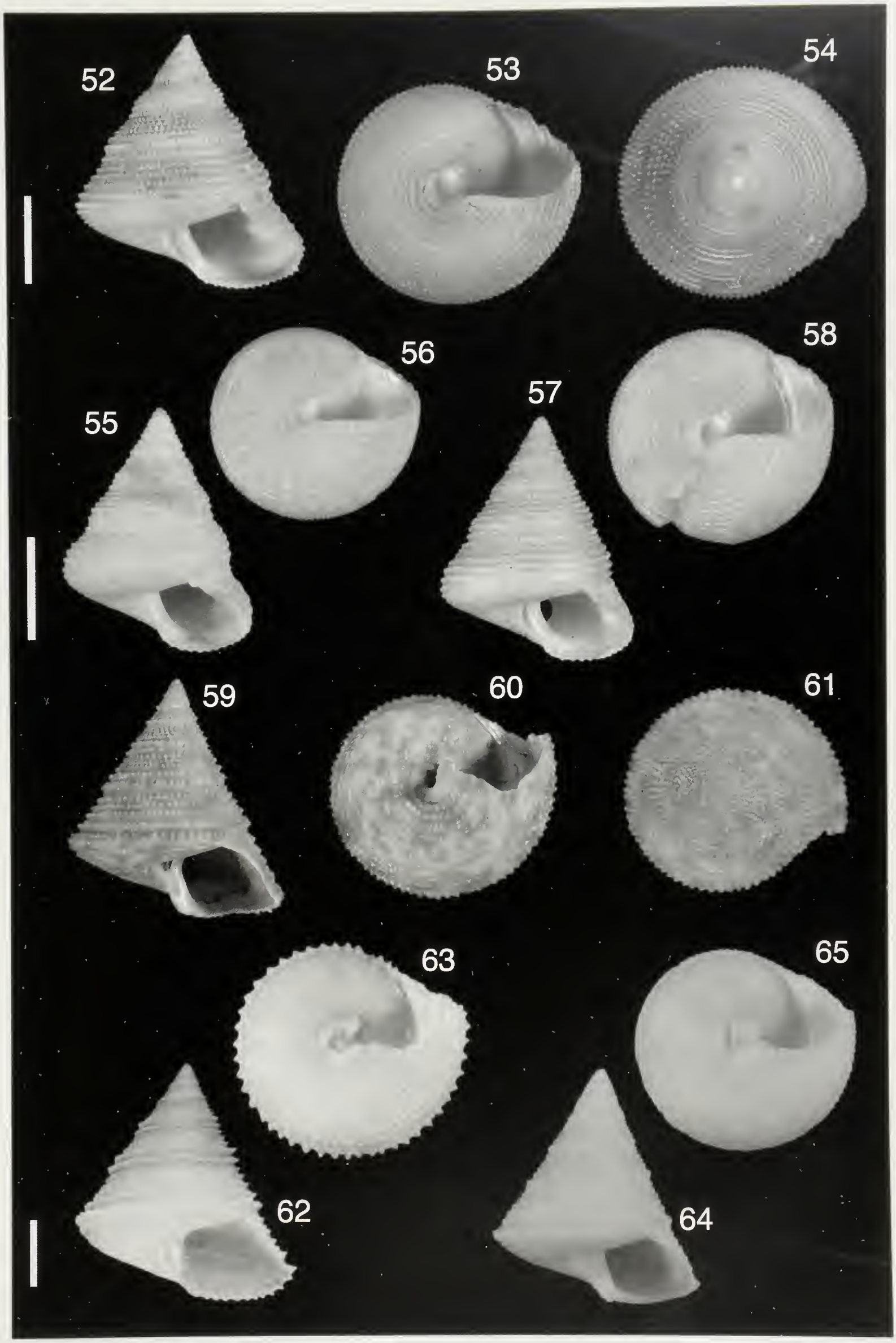
Distribution. Western Madagascar, living at 435-600 m.

Diagnosis. A typical yellowish *Calliostoma* species of rather great size, with an elevated, conical spire, the last whorls swollen at 2nd third, up to 10 granular, uneven spiral cords, the peripheral cord the strongest, an almost flat base with about 15 subgranular spiral cords, without umbilicus.

Description. *Shell* of medium size for the genus (height up to 17.5 mm, width up to 16.1 mm), slightly higher than wide, conical in shape; spire rather elevated, height 1.1x width, 4.2x aperture height; subangulate periphery; anomphalous.
Protoconch about 300 μm wide, of 1 whorl, rounded, covered by a network of ridges producing polygonal areas; apical fold straight without distinct terminal varix.

Figures 52-65 (scale bars: 5 mm).

52-54. ***Calliostoma tumidosolidum*** n. sp., holotype MNHN IM-2000-27746, Western Madagascar, 435-600 m [MIRIKY, stn CP3231], 17.5 x 16.1 mm.
55-56. ***C. paradigmatum*** Marshall, 1995, 422-495 m [NORFOLK 2, stn DW2109], 12.0 x 9.8 mm.
57-58. ***C. metivieri*** Marshall, 1995, 430-450 m [NORFOLK 2, stn DW2033], 13.4 x 10.5 mm.
59-61. ***C. pyrrou*** n. sp., Western Madagascar, holotype MNHN IM-2000-27747, 200-288 m [MIRIKY: stn DW3258], 11.8 x 10.5 mm.
62-63. ***C. paucicostatum*** Kosuge, 1984, Philippines, Cebu, Mactan, Punta Engano, holotype IMT, 19.2 x 18 mm.
64-65. ***C. caledonicum*** Marshall, 1995, 735-755 [BATHUS 3, stn DW795], 17.7 x 15.7 mm.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Teleoconch of up to 8 convex whorls, 4 last whorls with a bulge at 2nd third. Suture very poorly visible, not canaliculate.
First whorl convex, sculptured by axial, almost orthocline ribs, interspace between 1.5x to 2x larger than ribs; P1, P2 and P3 appearing almost immediately, thin, granular by intersection with axial threads; P3 slightly stronger than other cords. On second whorl, all cords stronger; axial ribs more prosocline; suture still visible. On third whorl, P4 emerging, almost as strong as P3; S1 appearing; beads of P3 weakly pointed; axial ribs thicker, distance between similar in size to ribs; suture hard to distinguish; S2 and S3 absent. On fourth whorl, all cords similar in strength, except S1 slightly weaker and P3 stronger with clearly pointed beads. On fifth whorl, T1 appearing between P1 and S1; axial ribs weakening; whorl more convex, with an abapical bulge; axial sculpture weakening and vanishing at end of whorl. On sixth whorl, beads of all cords pointed; S4 partially emerging, covered by succeeding whorl. On next whorls, few thin additional subgranular cords appearing (first one between P1 and T1). On last whorl, up to 10 uneven cords; S4 fully visible.
Aperture subquadrangular to subelliptical; outer lip rather thin, curved; basal part rounded, producing a weak rounded angle with outer lip and inner lip.
Columella weakly arcuate, oblique, without tooth; callus completely covering umbilicus.
Base weakly convex, with very weak, thin axial threads and 15 subgranular spiral cords, the cords in inner part stronger.
Colour of teleoconch first whorls nacreous pink, next whorls greenish yellow; base lighter; protoconch white.

Discussion. *C. tumidosolidum* n. sp. is rather close to *C. paradigmatum* Marshall, 1995 (Figs 55-56) from southern New Caledonia but this smaller species has a slightly larger protoconch (400-430 μm), a different cords ontogeny with 3 secondary cords, and S2 appearing first and less numerous, thicker spiral cords on the base.
The new species resembles *C. metivieri* Marshall, 1995 (Figs 57-58) from New Caledonia, but this similar in size species has a slightly larger protoconch (about 400 μm), a different cords ontogeny with 3 secondary cords and S2 appearing first and smooth cords on the base except the 3 or 4 inner granular cords.
C. tumidosolidum n. sp. may also be compared to *C. grohi* Stratmann & Stahlschmidt, 2007 from Saya de Malha Bank (south-western Indian Ocean), but this bigger species (height up to 30 mm) is almost as wide as low, has almost flat last whorls, more numerous spiral and thinner cords with a different ontogeny with 3 secondary cords.

Etymology. Swollen and solid (Latin: tumidus, a, um; solidus, a , um) - with reference to the swollen last whorls and the massive shape of the shell.

Calliostoma pyrron n. sp.
Figs G, 59–61, Table 3

Type material. Holotype (11.8 x 10.5 mm) MNHN IM-2000-27747. Paratypes: 2 MNHN IM-2000-27748, IM-2000-27749.

Type locality. Western Madagascar, MIRIKY, stn DW3258, 15°34'S, 45°44'E, 200-288 m.

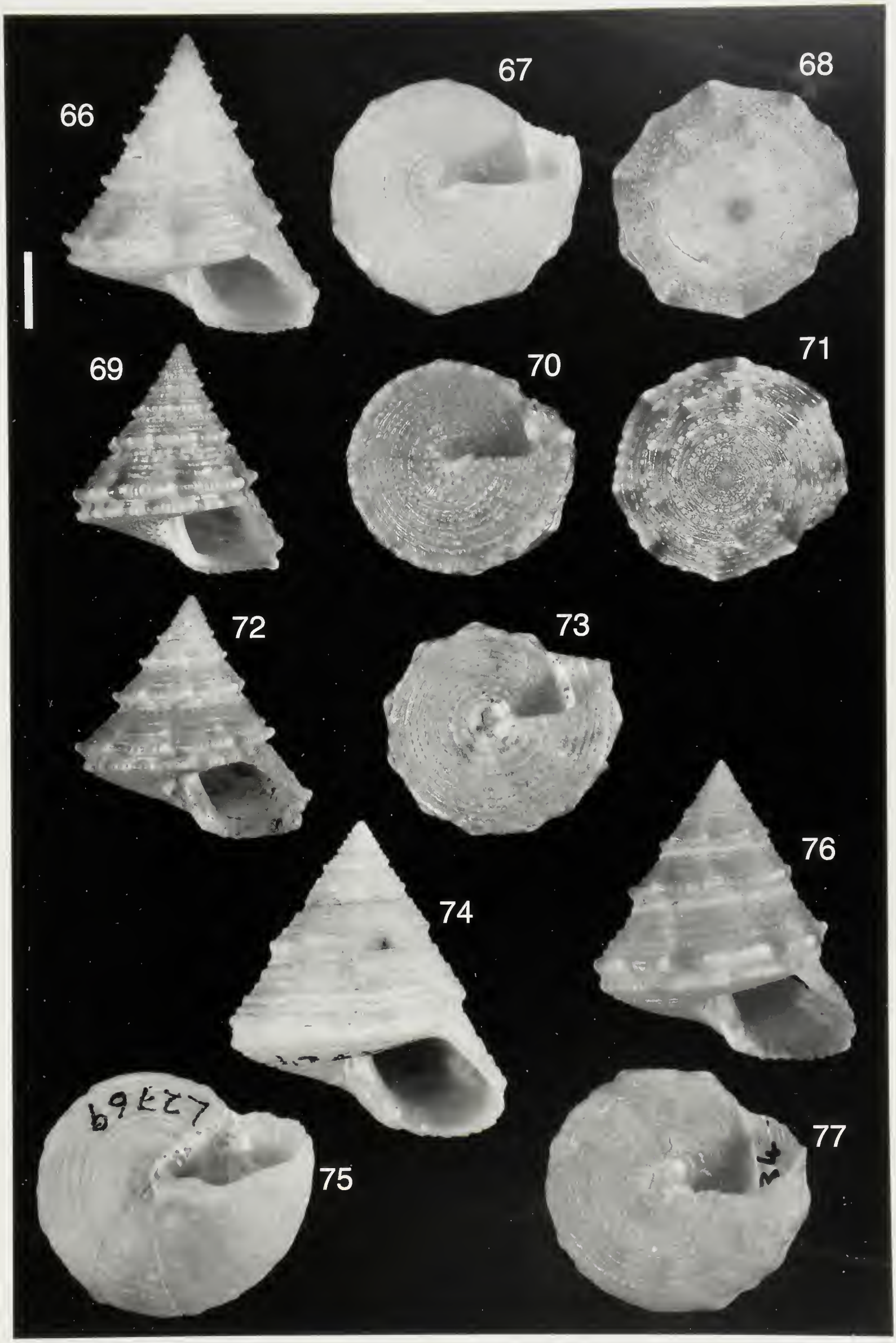
Material examined. Western Madagascar. MIRIKY: stn DW3208, 12°41'S, 48°17'E, 231-237 m, 1 dd (paratype IM-2000-27748). – Stn DW3209, 12°43'S, 48°14'E, 291-353 m, 1 dd (paratype IM-2000-27749). – Stn DW3258, 15°34'S, 45°44'E, 200-288 m, 1 dd (holotype IM-2000-27747). – Stn DW3261, 15°35'S, 45°43'E, 197-217 m, 1 dd.
Southern Madagascar. ATIMO VATAE: stn DW3584, 25°28'S, 44°25'E, 203-210 m, 1 dd, 1 dd juv.

Distribution. Western Madagascar, 217-291 m (dead), Southern Madagascar, 203-210 m (dead).

Diagnosis. A typical brown *Calliostoma* species of medium size, with an elevated, conical spire, up to 12 granular, uneven spiral cords, the peripheral cord the strongest with pointed beads, an almost flat base with about 12-14 granular spiral cords and a narrow umbilicus.

Figures 66-77 (scale bar: 5 mm)

66-77. ***Calliostoma herberti*** n. sp., Southern Madagascar.
66-68. Holotype MNHN IM-2000-27750, south-west of Andavaka Cape, 53-54 m [ATIMO VATAE, stn DW3549], 18.1 x 15.5 mm; **69-71.** Paratype MNHN IM-2000-27751, Cap Sainte Marie, 32 m [ATIMO VATAE, stn DW3609], 12.1 x 11.0 mm; **72-73.** Paratype MNHN IM-2000-27752, Lavanono area, by local fishermans, 13.1 x 12.7 mm; **74-77.** Mozambique; **74-75.** Off Beira (19°50'S, 34°51'E), Sofala Bank, 40-50 m, 25.2 x 22.2 mm (NMSA L2769); **76-77.** Off Quelimane (17°52'S, 36°53'E), 42 m, 20.2 x 17.2 mm (NMSA G8234).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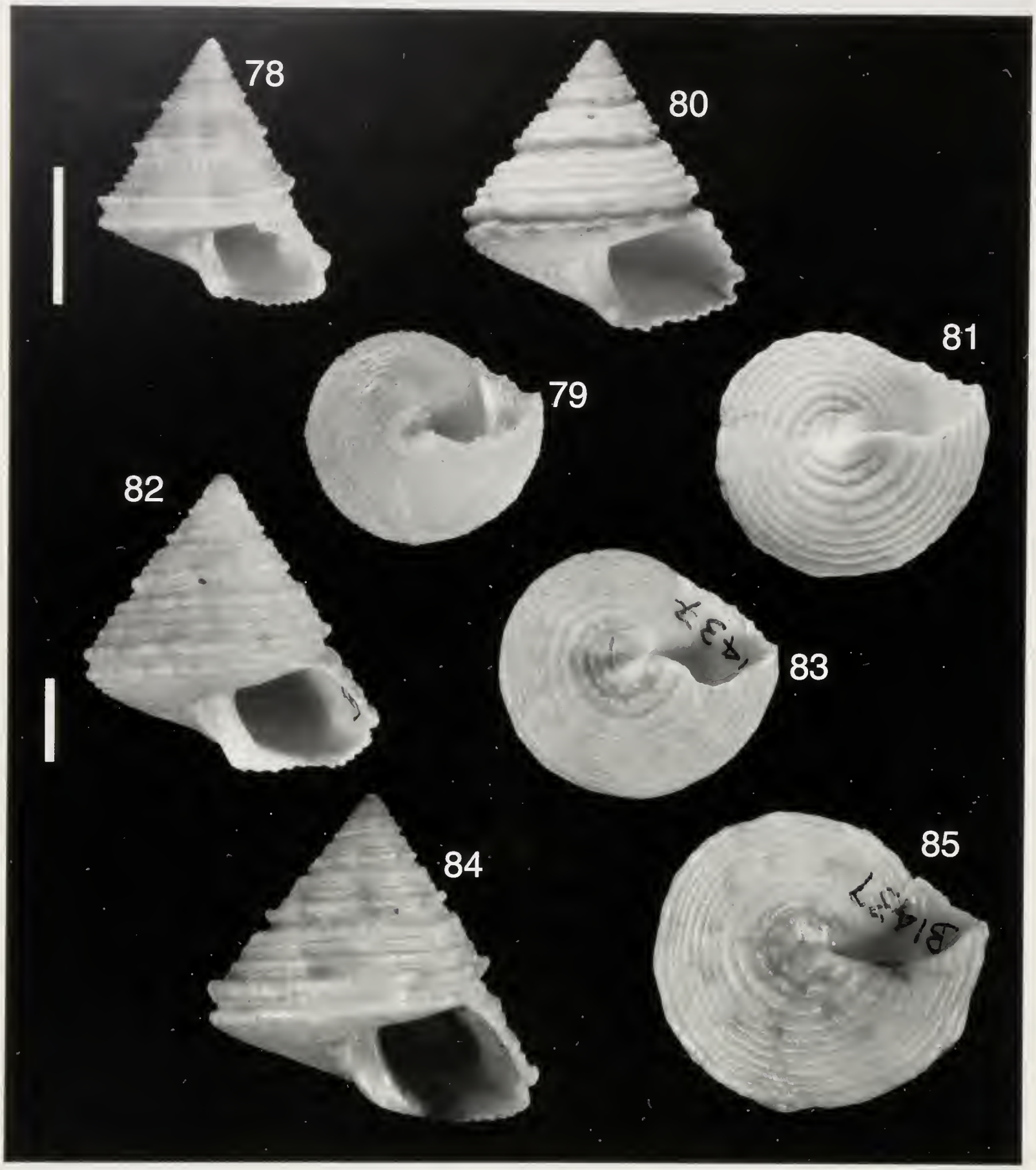


Figures 78-85 (scale bars : 5 mm)

78-79. ***Calliostoma thrincoma*** Melvill & Standen, 1903, syntype NHMUK (1903.12.15.122), Persian Gulf, depth unknown, 10.0 x 8.8 mm (Image courtesy of Harry Taylor, NHMUK Photographic Unit).
80-85. ***Calliostoma layardi*** Sowerby, 1897.
80-81. Holotype NHMUK (1899.4.14.3670), eastern South Africa, Pondoland, depth unknown, 13.0 x 14.0 mm (Image courtesy of Harry Taylor, NHMUK Photographic Unit); **82-85.** Transkei, Nthlonyane beach (between East London and Durban), beach drift (NMSA B1737). **82-83.** 16.6 x 16.3 mm; **84-85.** 20.0 x 15.8 mm.

Description. *Shell* of medium size for the genus (height up to 14.7 mm, width up to 12.9 mm), slightly higher than wide, conical in shape; spire rather elevated, height 1.1x width, 3.2x to 4.3x aperture height; angulate periphery; narrowly umbilicate.
Protoconch about 350 μm wide, of 1 to 1.25 whorl, rounded, eovered by a network of ridges giving a retieulate pattern; apical fold straight with a rounded terminal varix.
Teleoconch of up to 7.9 whorls; first whorl eonvex, other whorls flat, P3 and S3 produeing keel. Suture visible, not eanalieulate.
First whorl convex, sculptured by axial, almost orthoeline ribs, interspaee between 1.5x larger than ribs; P2 and P3 appearing almost immediately, P1 slightly later, granular by interseetion with axial threads; P3 slightly stronger than other eords; P4 almost eompletely eovered by suture. On seeond whorl, P3 mueh stronger than other cords, with bluntly pointed beads. On third whorl, beads of P3 sharp pointed; axial ribs more prosocline, thicker, distanee 2x larger than ribs. On fourth whorl, P4 emerging at beginning of whorl, quiekly as strong as P1 and P2; S1 appearing half a whorl later; S2 and S3 absent. On fifth whorl, P4 almost as strong as P3, both much stronger than other cords, with sharp pointed beads; S1 almost similar in strength to P1 and P2. On sixth whorl, beads of P1, S1 and P2 bluntly pointed; P4 stronger than P3, dividing into to cords, both with sharp pointed beads; axial ribs weakening and vanishing at end of whorl. On last whorls, tertiary cord T1 appearing first between P2 and P3, about 4-5 additional Ti appearing between Pi and Si, all subgranular to granular; S4 emerging at end of penultimate whorl, thin, weakly subgranular.
Aperture quadrangular; outer lip rather strong, without thiekening, straight; basal part almost straight, producing a sharp angle with outer lip and an obtuse angle with inner lip.
Columella more or less straight, oblique, without tooth; thin eallus partially covering umbilieus.
Base weakly eonvex, with 12 to 14 spiral cords and weak axial threads making eords subgranular in outer quarter, granular elsewhere; distanee between eords similar in size to eords; eords in inner part stronger.
Umbilieus narrow (diameter measuring about 10% of shell width), funnel shaped, without angulate rim.
Colour of teleoeoneh whorls and base brown with irregular axial ehestnut flames; protoconeh pinkish white.

	TW	H	W	HA	H/W	H/HA
holotype	7.6	11.8	10.5	3.7	1.12	3.19
paratype IM-2000-27748	7.9	14.7	12.9	3.4	1.14	4.32
paratype IM-2000-27749	7.1	12.5	11.7	3.8	1.07	3.29
means	7.5	13.0	11.7	3.6	1.11	3.60

Table 3. - *Calliostoma pyrron* n. sp. : Shells measurements in mm for types.

Discussion. *Calliostoma pyrron* n. sp. is rather close to *C. paucicostatum* Kosuge, 1984 (Figs 62-63) from Philippines but the latter speeies, slightly greater, is yellowish brown eoloured, laeks an open umbilieus, has a ontogeny of eords somewhat different, with S1 appearing mueh earlier (on 2nd whorl) and P4 not divided into two parts, less numerous and stronger spiral eords on the whorls and on the base (respeetively 6-7 and 11 eords) with much sharper nodules.
The new speeies also resembles *C. caledonicum* Marshall, 1995 (Figs 64-65) from New Caledonia, but this smaller speeies has a different ontogeny of primary eords (P1 and P2 eommeneing not before the 2nd whorl, S2 present) and roundly eonieal, not pointed, beads on thespiral cords of whorls.

Etymology. Chestnut (Aneient Greek : πυρρος, α, ον) - with referenee to the eolour of the flames on the whorls and on the base.

Calliostoma herberti n. sp.
Figs H, 66-77, Table 4

Type material. Holotype (18.1 x 15.5 mm) MNHN IM-2000-27750. Paratypes: 1 MNHN MNHN IM-2000-27751, 3 MNHN IM-2000-27752.

Type locality. Southern Madagascar, south-west of Andavaka Cape, ATIMO VATAE, stn DW3549, 25°17'S, 46°31'E, 53-54 m.

Material examined. Southern Madagascar. ATIMO VATAE: stn BB02, 25°36'S, 45°08'E, 11 m, 2 dd juv. – Stn BP22, 25°23'S, 44°52'E, 20-22 m, 1 dd. – Stn TA49, 25°00'S, 47°06'E, 19 m, 1 dd. – Stn DW3519, 24°52'S, 47°28'E, 80-83 m, 2 dd juv. – Stn DW3549, 25°17'S, 46°31'E, 53-54 m, 1 lv, 2 dd sub (lv holotype MNHN IM-2000-27750, molecular sample performed MNHN-2009-13605). – Stn DW3606, 25°49'S, 44°51'E, 44-46 m, 1 dd sub, 5 dd juv. – Stn DW3609, 25°34'S, 44°55'E, 32 m, 1 dd (1 paratype MNHN IM-2000-27751).– Stn s/n, Lavanono area, by loeal fishermans, 3 dd (3 paratypes MNHN IM-2000-27752).

Mozambique. Off Quelimane (17°52'S, 36°53'E), 42 m, 1 dd (NMSA G8234). – Off Beira (19°50'S, 34°51'E), Sofala Bank, 40-50 m, 1 dd (NMSA L2769).

Distribution. Southern Madagascar, 11-80 m, living at 53-54 m; Mozambique, 42 m (dead).

Diagnosis. A typical brightly coloured *Calliostoma* species of medium to rather big size, with an elevated, conical spire, usually with 5 spiral cords (an additional cord on large samples); cords granular on first whorls and nearly smooth on last whorls; one very strong abapical cord making keel; peripheral cord making a second keel on last whorl; flat base with about 8-11 granular spiral cords; umbilicus absent or reduced to a narrow chink.

Description. *Shell* of medium size for the genus (height up to 20.1 mm, width up to 16.9 mm), slightly higher than wide, conical in shape; spire rather elevated, height 1.0x to 1.2x width, 3.2x to 3.8x aperture height; angulate periphery; anomphalous (umbilicus reduced to small chink on subadult samples).

Protoconch about 250-300 μm wide, of 1 whorl, rounded, covered by a weak network of ridges giving a reticulate pattern; apical fold straight with a thin rounded terminal varix.

Teleoconch of up to 8.5 slightly convex whorls; P3 and P4 producing keel. Suture poorly visible, not canaliculate.

First whorl convex, P2 and P3 appearing immediately, P1 a quarter of whorl later, subgranular, evenly spaced; axial, almost orthocline ribs, visible ad mid whorl, interspace between 1.5x larger than ribs; P3 stronger than other cords. On second whorl, P3 much stronger than other cords, with bluntly pointed beads; axial ribs much stronger, making all cords granular by intersection. On third whorl, beads of P3 twice stronger than on preceding whorl, sharp pointed; each 2nd or 3rd bead much stronger; P3 making keel. On fourth whorl, P2 weaker than P1, with small beads, poorly rounded; beads of P1 strong, rounded; P4 partially emerging from suture, subgranular; axial ribs weakening, thin prosocline threads between them; S1 appearing at end of whorl, thin, subgranular; S2 and S3 absent. On fifth and sixth whorl, P2 and P3 subgranular, each 3rd bead of P3 still stronger; P1 and P4 still granular. On last whorls, all cords becoming weakly subgranular to nearly smooth, P1 the last to be still granular; P3 making strong, smooth keel; tertiary cord T1 appearing between P2 and P3 on large specimens.

Aperture subquadrangular; outer lip rather thin, rounded; basal part rounded, producing a rounded angle with outer lip and an obtuse angle with inner lip. Columella more or less straight, oblique, without tooth; callus covering umbilical area.

Base almost flat, with 8 to 11 spiral cords irregular in size, smooth; distance between cords similar in size to cords in outer part, twice larger in inner part; very weak axial threads between cords in inner part.

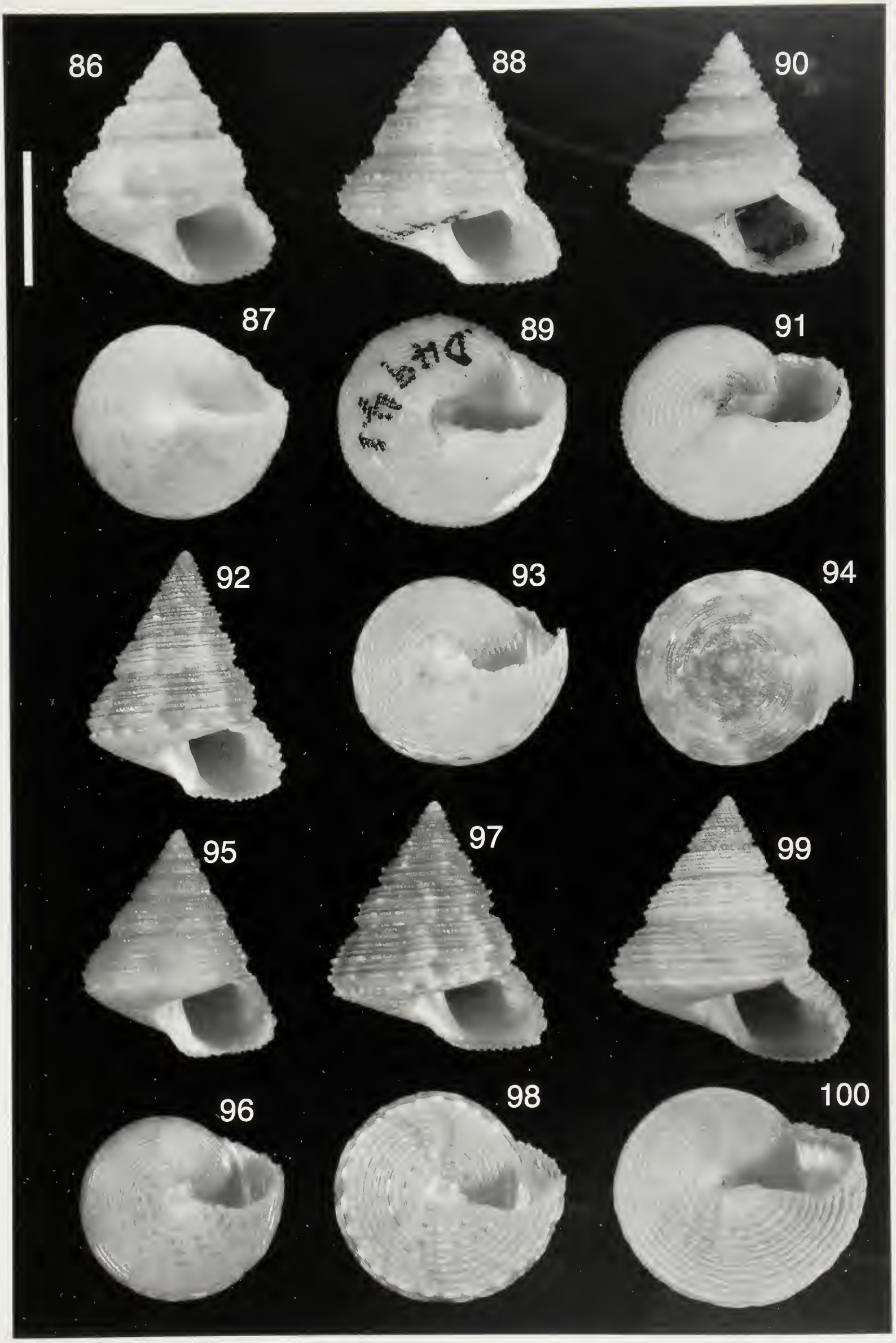
Colour of teleoconch whorls basically cream white; brownish axial flames; P1 and P2 (also S1 on some samples) with regular brown spots; P3 and P4 streaked white and light brown between brown areas made by flames; base pinkish white, spiral cords with regular brown dashes; protoconch white translucent.

	TW	H	W	HA	H/W	H/HA
holotype	8.5	18.1	15.5	4.9	1.17	3.69
paratype IM-2000-27751	7.9	12.1	11.0	3.8	1.10	3.18
paratype IM-2000-27752/1	7.8	13.3	12.3	4.2	1.08	3.17
paratype IM-2000-27752/2	8.5	20.1	16.9	5.4	1.19	3.72
paratype IM-2000-27752/3	7.5	10.7	10.7	2.8	1.00	3.82
means	8.0	14.9	13.3	4.2	1.11	3.52

Table 4. - *Calliostoma herberti* n. sp. : Shells measurements in mm for types.

Figures 86-100 (scale bar: 5 mm)

86-100. ***Calliostoma crossleyae*** E.A.Smith, 1910.
86-87, Paralectotype NHMUK (1911.8.30.14), South Africa, Natal, Isezela, depth unknown, 10.0 x 9.0 mm - Image courtesy of Harry Taylor, NHMUK Photographic Unit.
88-91. Zululand. **88-89.** Sodwana Bay (NM D4941), 20-22 m, 11.3 x 10.0 mm; **90-91.** South-east of Port Durnford (NM E8424), 95 m [NMDP, stn ZQ8], 9.8 x 8.9 mm.
92-100. Southern Madagascar. **92-94.** 14-26 m [ATIMO VATAE, stn TA51], 12.8 x 10.3 mm; **95-96.** South-east of Faux-Cap, 63 m [ATIMO VATAE, stn CP3624], 11.4 x 9.7 mm; **97-98.** 18-20 m [ATIMO VATAE, stn TA26], 12.6 x 10.7 mm; **99-100.** 37-38 m [ATIMO VATAE, stn DW3608], 13.6 x 12.2 mm.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Discussion. *Calliostoma herberti* n. sp. is rather close to *C. thrincoma* Melvill & Standen, 1903 (Fig 78-79) from Persian Gulf, but the latter species has an early appearing spiral cord S3 and a very different P3 on the last whorl, stronger than on penultimate whorl but thinner than on the new species.
The new species is weakly similar to *C. layardi* Sowerby, 1897 (Figs 80-85) from South Africa, but the latter species, similar in size, has a less elevated spire being more or less as wide as high, much coarser, thicker adapical spiral cords on the whorls, especially P1 almost as strong as P3 with much bigger beads, and S1 appearing earlier (at the beginning of the third whorl).

Etymology. Named after David "Dai" G.Herbert (NMSA) whose the numerous malacological works have brought great advances in systematics, especially for Trochoidea.

Calliostoma crossleyae E.A.Smith, 1910
Figs 86–100

Calliostoma crossleyae E.A. Smith, 1910: 205. Type locality: Isezela, Natal, South Africa, depth unknown.
Calliostoma crossleyae – Kaicher: card # 2088.
Calliostoma crossleyae – Steyn & Lussi: 22, fig. 69.

Material examined. Southern Madagascar. ATIMO VATAE: stn TA10, 25°28'S, 44°56'E, 23 m, 1 dd. – Stn TV12, 25°02'S, 47°01'E, 27 m, 1 lv (molecular sample performed - IM-2009-13656).. – Stn TP17, 25°01'S, 47°01'E, 33-34 m, 1 dd sub. – Stn BP22, 25°23'S, 44°52'E, 20-22 m, 1 dd sub. – Stn TA26, 25°34'S, 45°07'E, 18-20 m, 1 lv. – Stn TA51, 25°00'S, 47°06'E, 14-26 m, 1 dd. – Stn TA54, 25°00'S, 47°09'E, 15-25 m, 1 dd. – Stn TA57, 24°59'S, 47°03'E, 8-16 m, 1 lv. – Stn DW3519, 24°52'S, 47°28'E, 80-83 m, 1 dd sub. – Stn DW3547, 25°18'S, 46°40'E, 69-70 m, 1 dd juv. – Stn DW3508, 25°16'S, 47°06'E, 77-78 m, 1 dd, 3 dd sub. – Stn CP3572, 25°12'S, 47°12'E, 75-77 m, 1 lv. – Stn CP3573, 25°14'S, 47°14'E, 87-88 m, 2 lv sub. – Stn DW3605, 24°55'S, 44°51'E, 56-57 m, 1 dd sub. – Stn DW3606, 25°48'S, 44°51'E, 14-26 m, 3 lv (molecular sample performed - IM-2009-13658 & IM-2009-13665). – Stn DW3607, 25°46'S, 44°52'E, 40-41 m, 1 dd, 1 dd sub. – Stn DW3608, 25°39'S, 44°53'E, 37-38 m, 1 dd. – Stn DW3623, 25°41'S, 45°59'E, 74-80 m, 2 dd sub, 3 dd juv. – Stn CP3624, 25°38'S, 45°57'E, 63 m, 2 lv (molecular sample performed - IM-2009-13636). – Stn s/n, Lavanono area, by local fishermans, 1 dd.
Zululand. Sodwana Bay, 20-22 m, 1 dd (NMSA D4941). – South-east of Port Durnford, NMDP: stn ZQ8, 29°05'S, 32°08'E, 95 m, 1 dd (NMSA E8424). – Stn ZQ10, 29°07'S, 32°07'E, 95 m, 1 dd (NMSA E8580). – Off Cappe Vidal, R.V. Neiring Naude: stn 2M3, 28°08'S, 32°36'E, 50 m, 1 dd (NMSA E4980). – Off Park Rynie, R.V. Neiring Naude: stn X7, 30°23'S, 30°51'E, 140 m, 2 dd (NMSA E4932).

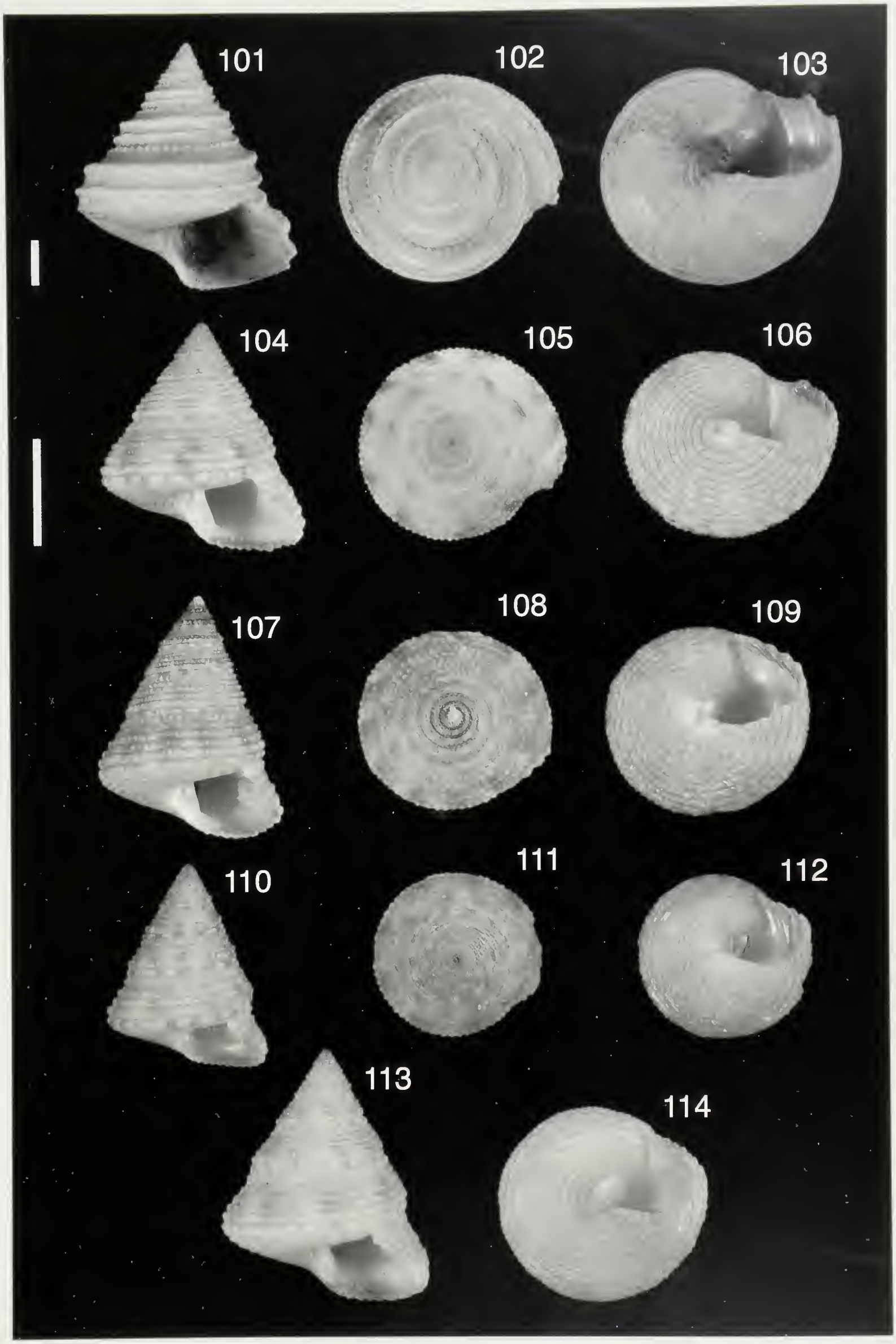
Distribution. Eastern South Africa, Zululand, 22-140 m (dead); Southern Madagascar, 16-87 m, living at 16-75 m.

Remarks. The main characteristics of this species are:
– height up to 18 mm, width up to 14 mm;
– rather high spire, higher than wide, conical to slightly coeloconoidal shape, angulate periphery with up to 8-9 slightly convex whorls, with an excavated-like suprasutural area;
– protoconch about 300 μm wide, of 1 whorl;
– teleoconch with granular spiral cords; P1, P2 and P3 appearing immediately, S1 appearing on fourth whorl, P4, S2 and S3 on fifth whorl and additional tertiary cords possibly appearing on next whorls; about 10 cords on last whorls;
– a convex to almost flat base with 10-11 smooth spiral cords;
– anomphalous;
– orange brown colour or basically cream white with brownish axial flames, P4 always streaked white and brown.

Compared to specimens from Natal, some specimens from southern Madagascar may have a slightly more elevated spire, whorls not so convex and, more specifically, sharp, regularly located pointed beads on P2 and P3 of intermediate whorls (one pointed bead per three rounded beads). The ontogeny of the spiral cords is the same on all specimens, wherever they are coming from.

Figures 101-114 (scale bars: 5 mm)

101-103. ***Calliostoma muriellae***, Western Madagascar, 243-950 m [MIRIKY, stn CP3253], 26.1 x 24.1 mm.
104-114. ***Dactylastele burnupi*** (E.A. Smith, 1899).
104-106. Zululand, shore, 10.9 x 9.9 mm (NMSA W2189). **107-112.** Southern Madagascar. **107-109.** 14-18 m [ATIMO VATAE, stn BV06], 11.4 x 8.5 mm. **110-112.** Recorded sample (MNHN 200913653), 29 m [ATIMO VATAE, stn TA45], 7.8 x 5.9 mm. **113-114.** South africa, Natal Park Rynie, depth unknown, 12.2 x 10.0 mm, coll. C.Vilvens.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Calliostoma muriellae Vilvens, 2001
Figs 101-103

Calliostoma muriellae Vilvens, 2001: 175-178, figs 1-4. Type locality: Madagascar, off Majenga, 800 m.

Material examined. Western Madagascar. Chalutage 109, 22°17'S, 42°56'E, 1200 m, 1 dd. – MIRIKY: stn CP3253, 15°25'S, 45°55'E, 243-950 m, 1 dd.

Remarks. The main characteristics of this species are:
– height up to 30 mm, width up to 27 mm;
– rather high spire, higher than wide, conical shape, angulate periphery, with up to 8 slightly convex to almost flat whorls;
– protoconch about 300 μm wide, of 1.25 whorl;
– teleoconch with granular spiral cords; P1, P2 and P3 appearing immediately, granular; P4 appearing on second whorl; P2 and P3 making keel, much stronger than other cords; smooth weak secondary cords S1, S2 and S3 occasionally appearing on some specimens;
– flat or weakly convex base, with one or two smooth external strong cords and 3 or 4 large subgranular cords around umbilical area;
– anomphalous;
– white or pinkish white, slightly iridescent.

Genus : ***Dactylastele*** Marshall, 1995
Type species : *Trochus (Zizyphinus) poupineli* Montrouzier, 1875 (by o.d.) – Recent, tropical western Pacific.

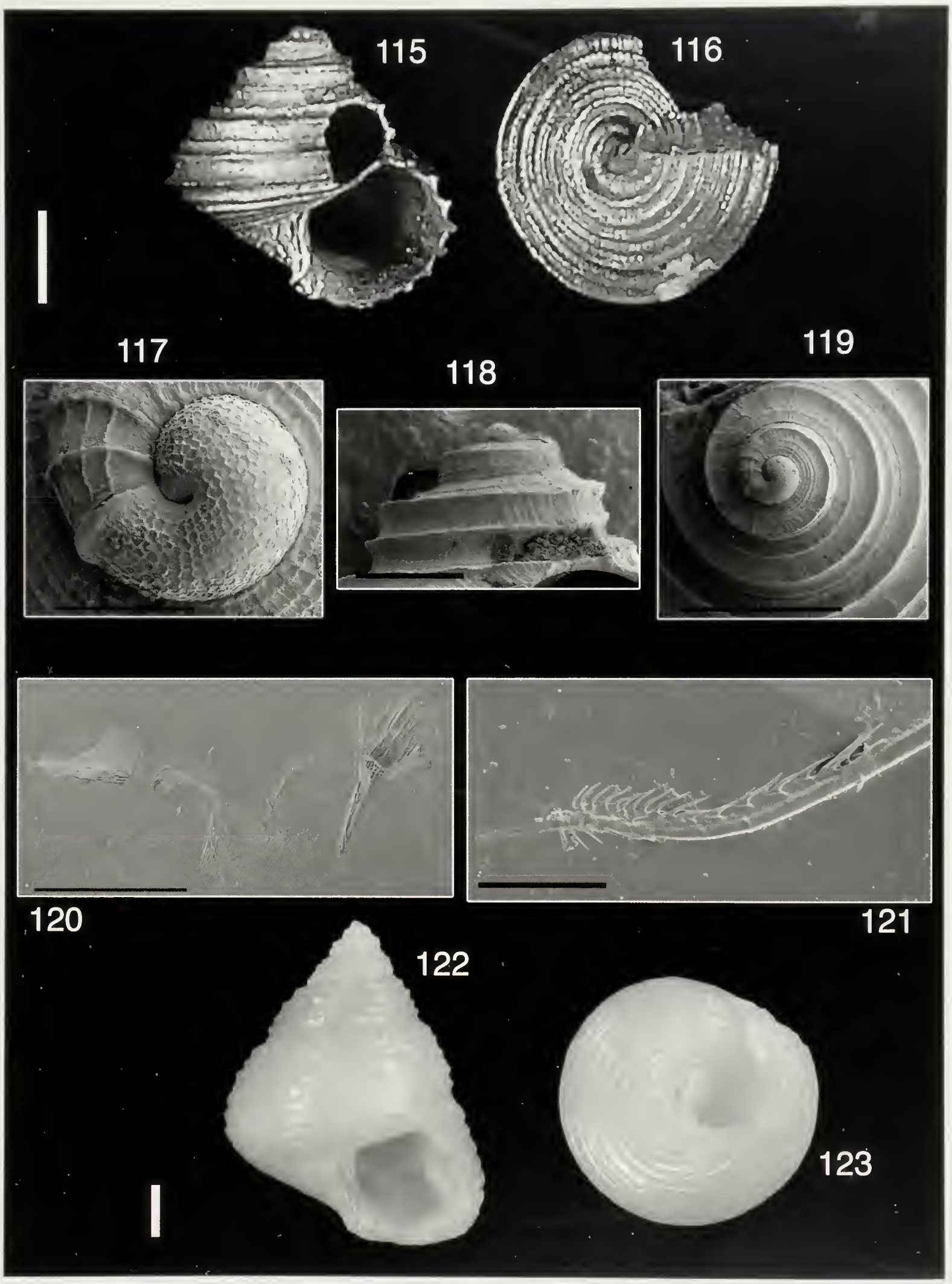
Dactylastele burnupi (E.A. Smith, 1899)
Figs 104–114

Calliostoma burnupi E.A. Smith, 1899: 250, pl. 5, fig. 11. Type locality: off Durban, KwaZulu-Natal.
Calliostoma burnupi – Kensley: 22, fig 65.
Calliostoma burnupi – Kaicher: card # 2081.
Calliostoma burnupi – Kilburn & Rippey: 39, pl.8-2.
Dactylastele burnupi – Marshall: 424.
Calliostoma burnupi – Steyn & Lussi: 22, fig. 65.

Material examined. Southern Madagascar. ATIMO VATAE: stn BS01, 25°28'S, 44°56'E, 12-14 m, 1 dd sub. – Stn TB01, 25°00'S, 47°06'E, 22 m, 3 dd juv. – Stns TB02-TB03, 25°01'S, 47°00'E, 18 m, 2 dd juv. – Stn TS02, 25°01'S, 47°00'E, 18 m, 6 dd juv. – Stn BB03, 25°26'S, 44°56'E, 14-18 m, 6 lv juv. – Stn BS03, 25°26'S, 44°56'E, 14-18 m, 1 dd, 2 dd juv. – Stn TS03, 25°01'S, 47°01'E, 24 m, 1 dd sub, 1 dd juv. – Stn TB04, 25°02'S, 47°00'E, 11-12 m, 2 dd juv. – Stn TS04, 25°02'S, 47°00'E, 22-24 m, 2 dd sub, 3 dd juv. – Stn BS05, 25°35'S, 45°08'E, 12 m, 1 dd juv. – Stn TB05, 25°02'S, 47°00'E, 23 m, 2 dd sub, 3 dd juv. – Stn BV06, 25°27'S, 44°56'E, 14-18 m, 1 lv. – Stn TB06, 25°04'S, 46°57'E, 4-5 m, 2 dd sub, 20 dd juv. – Stn TB07, 25°03'S, 47°00'E, 4-5 m, 1 dd sub. – Stn TV07, 25°01'S, 47°00'E, 12-16 m, 4 dd juv. – Stn BS09, 25°29'S, 44°57'E, 11-13 m, 4 dd juv. – Stn TS09, 24°57'S, 47°06'E, 5-6 m, 1 dd, 1 dd sub, 2 dd juv. – Stn BS10, 25°19'S, 44°37'E, 12-14 m, 3 dd juv. – Stn TS10, 24°57'S, 46°07'E, 7 m, 1 lv sub. – Stn TS11, 25°04'S, 46°57'E, 4-5 m, 1 lv juv. – Stn TB12, 25°02'S, 47°00'E, 4-5 m, 1 dd, 1 dd sub, 12 lv juv. – Stn TB13, 25°02'S, 47°00'E, 2-4 m, 1 lv sub, 4 dd juv. –Stn TS13, 25°02'S, 47°00'E, 5-6 m, 1 dd sub. – Stn BS14, 25°36'S, 45°09'E, 16 m, 5 dd juv. – Stn BS15, 25°29'S, 44°57'E, 11-12 m, 1 dd juv. – Stn TS15, 25°09'S, 46°45'E, 13 m, 4 dd juv. – Stn BS16, 25°35'S, 45°08'E, 15 m, 9 dd juv. – Stn TS16, 25°10'S, 46°45'E, 9-10 m, 1 dd juv. – Stn TP21, 25°03'S, 46°59'E, 23-25 m, 1 dd juv. – Stn TS21, 25°02'S, 47°00'E, 2-4 m, 3 dd sub, 1 dd juv. – Stn TP25, 25°04'S, 46°58'E, 7-9 m, 3 dd juv. – Stn BP42, 25°23'S, 44°51'E, 18-21 m, 1 dd sub. – Stn TA45, 24°51'S, 47°13'E, 29 m, 1 lv (molecular sample performed MNHN IM-2009-13653). – Stn TA52, 25°02'S, 47°00'E, 8-14 m, 2 dd sub. – Stn DW3519, 24°52'S, 47°28'E, 80-83 m, 1 dd sub. – Stn DW3530, 24°36'S, 47°32'E, 80-86 m, 1 dd sub, 1 dd juv. – Stn DW3531, 24°38'S, 47°31'E, 54-56 m, 1 dd juv. – Stn DW3550, 26°03'S, 45°32'E, 98 m, 1 dd sub. – Stn CP3572, 25°12'S, 47°12'E, 75-77 m, 1 dd sub.
Mayotte. BENTHEDI: stn 32, 12°45'S, 45°17'E, 15-20 m, 1dd, 2 dd sub. – Stn 79, 12°33'S, 44°36'E, 25 m, 1dd.
Mozambique. NE of Inhaca Is., Baixo d'Anane wreck, 10 m, 1 lv (NMSA L3626) . – Inhaca Is., intertidal pools, 1 dd (NMSA L1479). – North of Ponta do Ouro, 20 m, 2 dd (NMSA L3392) . – North of Bazaruto, 1 lv (NMSA G87). – Pemba, 1 dd (NMSA L2054).

Figures 115-123 (scale bars for shells: 1 mm)

115-121. ***Carinastele wareni*** n. sp., holotype MNHN IM-2009-13183, Southern Madagascar, 282-333 m [ATIMO VATAE, stn DW 3557].
115-116. 2.5 x 2.7 mm. **117.** Protoconch (scale bar: 200 μm). **118.** First whorls (scale bar: 0.5 mm). **119.** First whorls (scale bar: 1 mm) **120.** Radula (scale bar: 1 mm). **121.** Tips of radula tooth (scale bar: 10 μm) (Images 9-11 courtesy Anders Warèn, SMNH). **122-123.** ***Bruceina cognata*** (Marshall, 1988), Mozambique Channel, 228-230 m [MAINBAZA, stn DW 3167], 5.5 x 4.4 mm.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KwaZulu-Natal. Umdloti, 29°41'S, 31°07'E, intertidal pools, 1 dd (NMSA W2189). – Between Bhanga Neck and Kosi Bay, 4-10 m, 4 dd , 1 dd juv (NMSA S962) . – Between Bhanga Neck and Kosi Bay, 6-18 m, 1 dd (NMSA D9507) . – Off Boteler Point, 27°01'S, 32°55'E, 1 lv (NMSA E2947).
Mauritius. Off Trou aux Biches, 10 m, 1 dd, 2 dd juv (NMSA K8537).
Réunion Island. Possession Bay, 3-6 m, 2 lv, 2 lv sub, 2 lv juv (NMSA K5123).

Distribution. Southern Madagascar, 4-98 m, living at 4-14 m; Mayotte, 15-25 m (dead); Mozambique, 0-20 m, living at 10 m; eastern South Africa (Kwazulu-Natal), 0-6 m (living); Mauritius, 10 m (dead); Réunion Island, 3-6 m (living).

Remarks. The main characteristics of this species are:
– height up to 14 mm, width up to 11 mm;
– high spire, conical in shape, angular periphery, with up to 8 whorls;
– protoconch about 200 μm wide, of 1 whorl;
– teleoconch whorl with granular spiral cords; P1, P2 and P3 appearing immediately, granular; P3 stronger than other cords; P4 emerging from suture on third whorl; S2 appearing first, S1 appearing later; on last whorls, all cords becoming more or less similar in size;
– weakly convex base with about 9 broad, subgranular spiral cords;
– anomphalous;
– first whorls dark violet or red; next whorls orange brown and beads of spiral cords lighter, with darker brown axial flames and a brown line between the cords; P4 white with regular brownish strokes; cords of base light brown with regular darker spots and a brown line in the interspace.

Subfamily **THYSANODONTINAE** Marshall, 1988
Genus ***Carinastele*** Marshall, 1988
Type species: *Carinastele kristelleae* Marshall, 1988 (by o.d.) – Recent, New Zealand.

Carinastele wareni n. sp.
Figs I, 115–121

Type material. Holotype (2.5 x 2.7 mm) MNHN IM-2009-13183.

Type locality. Southern Madagascar, ATIMO VATAE: stn DW 3557, 26°08'S, 45°39'E, 282-333 m.

Material examined. Only known from the type material (living, molecular sample performed MNHN-2009-13).

Distribution. Southern Madagascar, living at 282-333 m.

Diagnosis. A typical *Carinastele* species of small size, slightly wider than high, with a conical spire and up to 5 spiral cords making strong keel with concave interspaces; convex base with 6 strong, smooth spiral cords; umbilicus deep and wide.

Description. *Shell* of small size for the genus (height up to 2.5 mm, width up to 2.7 mm), slightly wider than high, conical in shape; spire moderately elevated, height 1.2x width, 1.7x aperture height; angulate periphery; narrow, deep umbilicus.
Protoconch about 350 μm wide, of 1.25 whorl, rounded, covered by a reticulate network; apical fold straight with a strong terminal varix.
Teleoconch of up to 3.2 slightly convex whorls; P2 and P3 producing keel. Suture visible, not canaliculate.
First whorl convex at first part, quickly with a strong, oblique shoulder at second part; four Pi appearing immediately; 3 prosocline ribs on first third of whorl, interspace between 4x larger than ribs; P2 quickly stronger, producing a strong keel in second part of the whorl; S1 appearing at first quarter of whorl, with T1 and T2 around it, all very thin. On second whorl, the 3 adapical Pi stronger, P2 the strongest, P1 the weakest, P2 and P3 making keel with concave interspace; P4 sunken under suture; axial threads still visible, weak; S1, T1 and T3 vanishing. S2 appearing at begin of third whorl, quickly as strong as P1, both producing secondary keels. On last whorl, P4 visible, making keel like P3; all spiral interspaces concave.
Aperture subcircular, without angle, with large basal flange near meeting of outer and inner lip.
Columella slightly arcuate, without tooth.
Base moderately convex, with 6 smooth spiral cords; distance between cords irregular, from 1x to 2x width of cords; very weak axial threads between cords.
Umbilicus deep, fairly wide (about 20%), funnel shaped, with 2 strong spiral cords inside.
Radula with thin, hair-like teeth with long slender cusp and backward-directed barbs, 4 barbs spreading out outwards (Figs 120-121).

Discussion. *Carinastele wareni* n. sp. belongs clearly to the genus *Carinastele*, having prominent, strong, carinate spiral cords with an early strong P3 and without S3, and tips of radular teeth with backwardly inclined barbs, 4 barbs splaying outward the other barbs series (Marshall, 1988; Hickman & Mc Lean, 1990). One can compare with *Bruceina cognata* (Marshall, 1988) (Figs 122-123) (ex-*Herbertina cognata* Marshall, 1988 because *Herbertina* Marshall, 1988 is a junior homonym of *Herbertina* Schaus, 1901 [Lepidoptera]; *Bruceina* is a replacement name (Özdikmen, 2013; WoRMS, 2014)).
The small size and the presence of an umbilicus could suggest that the studied specimen has not reached full maturity, although the teleoconch has 3.2 whorls. Maybe should one also adapt the *Carinastele*

definition to include the possibility of an open umbilicus.
The new species is rather close to *Carinastele jugosa* Marshall, 1988 from New Zealand, but this taller, more elevated species has no S2, no umbilicus and has 8-9 (instead of 6 on the new species) spiral cords on the base.

Etymology. Named after Anders Warén (NMSA), one of the head of the European malacology, specialist in gastropod taxonomy and always ready to provide his valuable help.

ACKNOWLEDGEMENTS

We would like to thank P. Bouchet (MNHN) for reading the manuscript, constructive advice and access to the malacological resources of the MNHN, V. Héros (MNHN) for her help in providing locality data and finding various scientific information, D. Herbert (NMSA) for the loan of material from South Africa and Mozambique and Anders Warén (SMNH) for the SEM photographs.
Also, we are very grateful to S.Williams (NHMUK) for her help to search material in the NHMUK collections and A.Salvador (NHMUK) for her help to get photographs of types and information about them.

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Informations about the "La planère revisitée" program (access on 2014-08-6).

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